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Idiopathic Unilateral Vitreous Hemorrhage Related to SARS-CoV-2 Virus Vaccine: A Case Report and Literature Review

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Abstract

Abstract Purpose: To report a case of idiopathic vitreous hemorrhage in a healthy old-aged woman who was discovered after receiving the COVID-19 vaccine and being infected with the coronavirus.

Case presentation: A 51-year-old female with no significant medical history presented complaining of mild blurry vision in the right eye that had developed progressively over the previous year. The patient tested positive for coronavirus in 2021 and had received three doses of the COVID-19 vaccine. An ocular examination of the affected eye revealed vitreous hemorrhage. The patient was treated with a regular course of intravenous injections (Eylea).

Conclusions: Idiopathic vitreous hemorrhage is a rare condition, particularly in healthy older adults. The potential association between coronavirus infection, COVID-19 vaccination, and vitreous hemorrhage warrants further investigation through large-scale studies. Clinicians should be aware of this potential association and consider it in the differential diagnosis of patients presenting with vitreous hemorrhage.

Keywords: Case Report, Vitreous Hemorrhage, COVID-19 Vaccine, Corona Virus, Idiopathic.

Introduction

The outbreak of the coronavirus disease 2019 (COVID-19), caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has had a significant impact on healthcare systems and global populations **[1]**.

The disease has resulted in a high number of deaths and severe illness, particularly in older individuals and those with underlying health conditions such as respiratory difficulties, heart abnormalities, renal disorders, diabetes, or hypertension. The primary symptoms of COVID-19 include fever, cough, weakness, diarrhea, sore throat, and loss of taste and smell **[2]**.

Recent research has shown that SARS-CoV-2 can lead to abnormal coagulation and thromboembolic consequences, which are major causes of multiorgan failure and other morbidities in COVID-19 patients **[3]**. In addition to these severe effects, SARS-CoV-2 can also cause ocular involvement, although this is less common. Conjunctivitis, characterized by redness and irritation in the eyes, is one of the most frequently reported ocular symptoms of SARS-CoV-2 infection **[4]**.

We report a case of a 51-year-old female patient who developed a unilateral vitreous hemorrhage in the right eye after contracting SARS-CoV-2. This case highlights the potential for post-COVID-19 thromboembolic inflammatory conditions to cause diverse retinal occlusive consequences, even in otherwise healthy individuals. The purpose of this case report is to increase awareness of these potential complications and to further our understanding of how SARS-CoV-2 can affect the eyes.

Case presentation

A 51-year-old female patient, who was otherwise healthy, presented with a complaint of gradually progressive decreased and blurred central vision in her right eye. She had received three COVID-19 vaccinations, with her first and second doses (AstraZeneca) being administered with a five-month interval between them and the third booster vaccine (Pfizer-Biotech) being administered seven months later **[Figure 5]**.

Figure 5: The 3 Doses of COVID-19 Vaccine Taken.

The patient had previously tested positive for COVID-19 in February 2021, before her third vaccine dose, and had recovered fully. She had no history of diabetes mellitus, hypertension, or any other chronic illnesses, was not a smoker, and had no known food or drug allergies. The patient reported no similar complaints or ocular traumas in the past.

The patient sought medical attention later in 2021, and was examined by an ophthalmologist who administered Cyclopentolate eye drops to improve the view of her eye. After a slit lamp examination, her doctor ordered a laser tomography which revealed a diffused vitreous hemorrhage in her right eye with a normal examination of the left eye **[Figure 1]**.

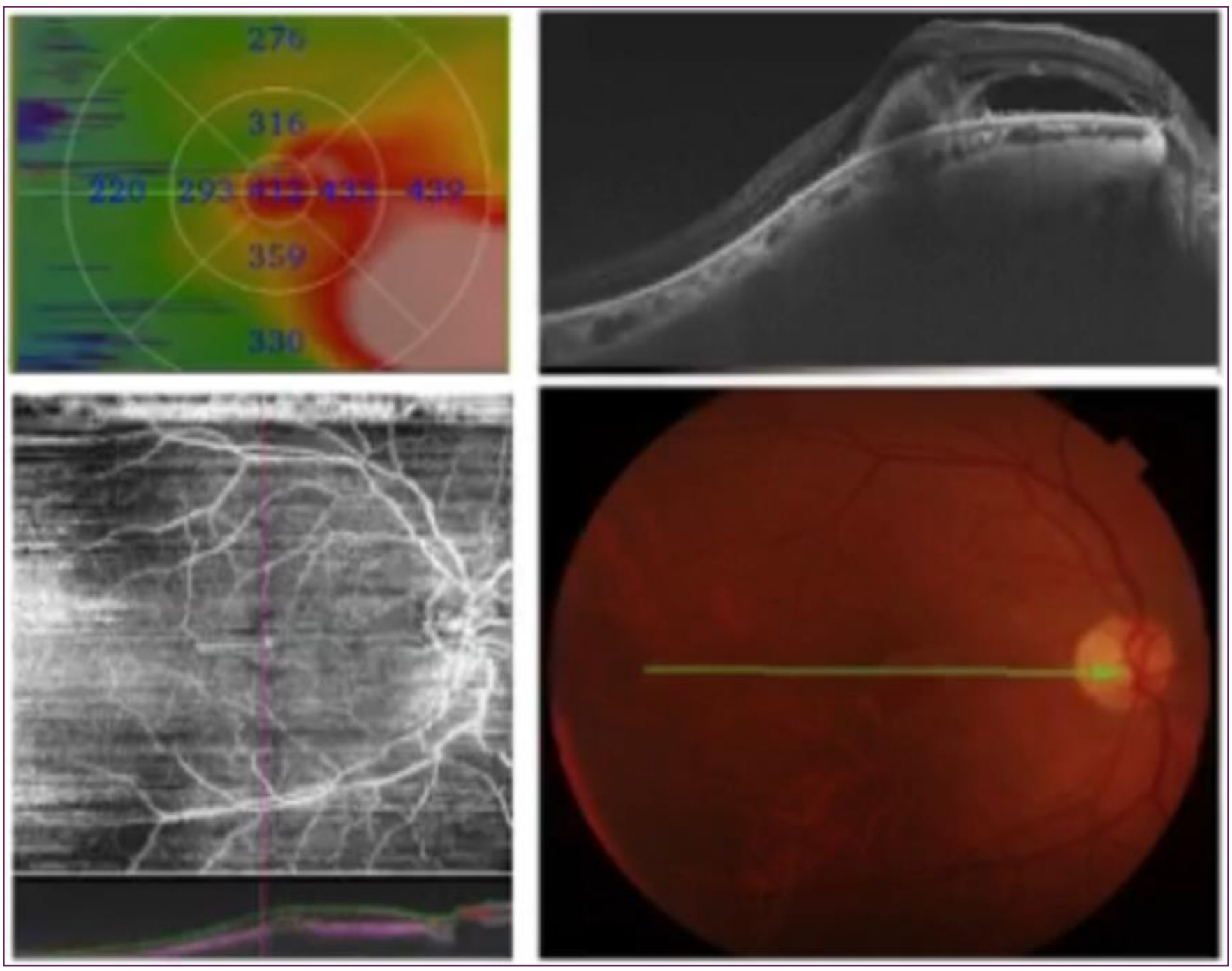

Figure 1: Vitreous Hemorrhage in the Right Eye Before Injections.

The cause of the intravitreal hemorrhage was unknown as the patient had no previous episodes of the same complaint and had only started experiencing symptoms after her COVID-19 infection.

The patient was prescribed Intravitreal injections (Aflibercept “Eylea”) to help decrease and prevent further bleeding. She received her first injection within one month of being examined, with slight improvements in her vision being noticed **[Figure 2]**.

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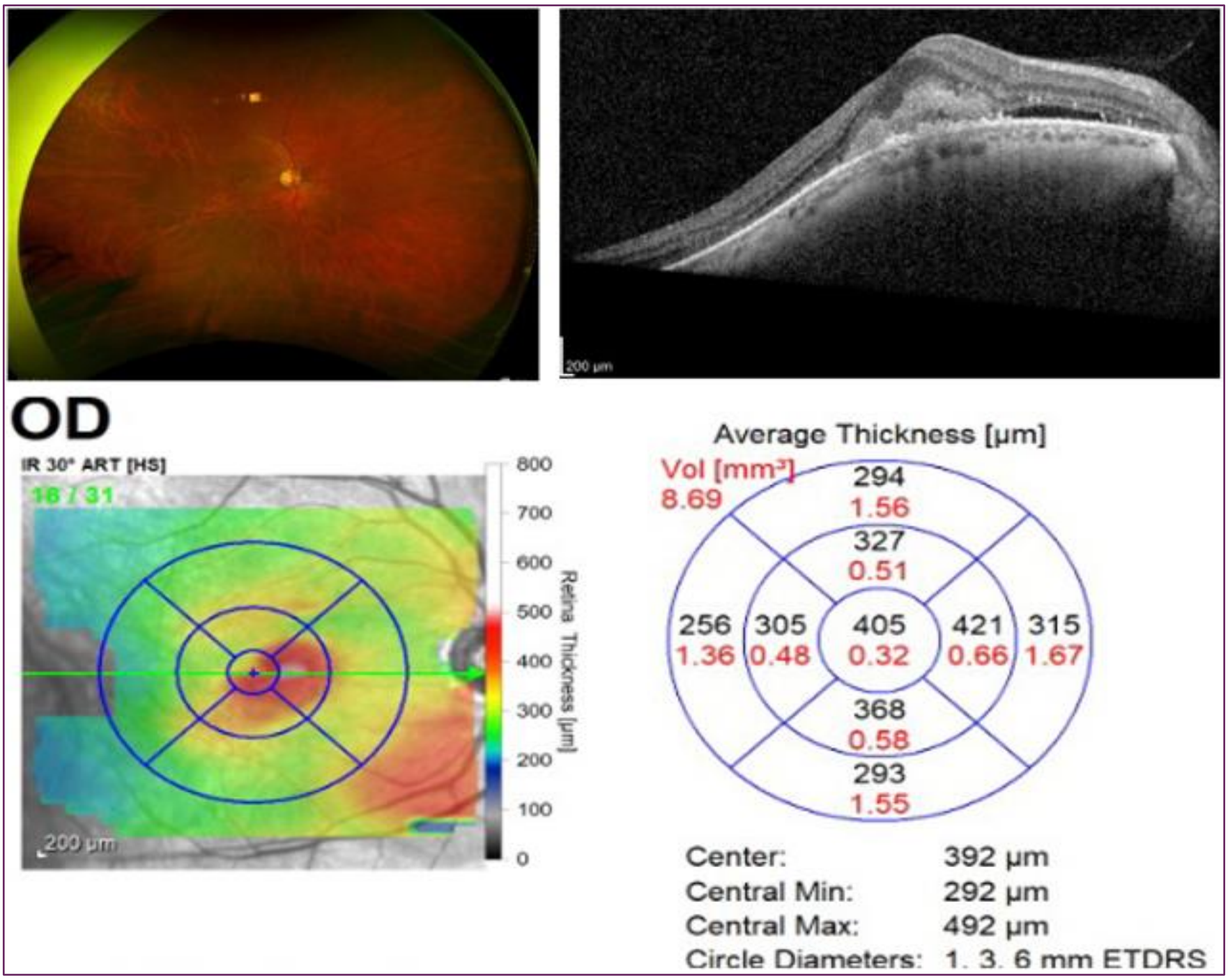

Figure 2: The Right Eye Results After the First Injection.

The patient received additional intravitreal injections after a month of the first injection, and further improvements were observed **[Figure 3]**.

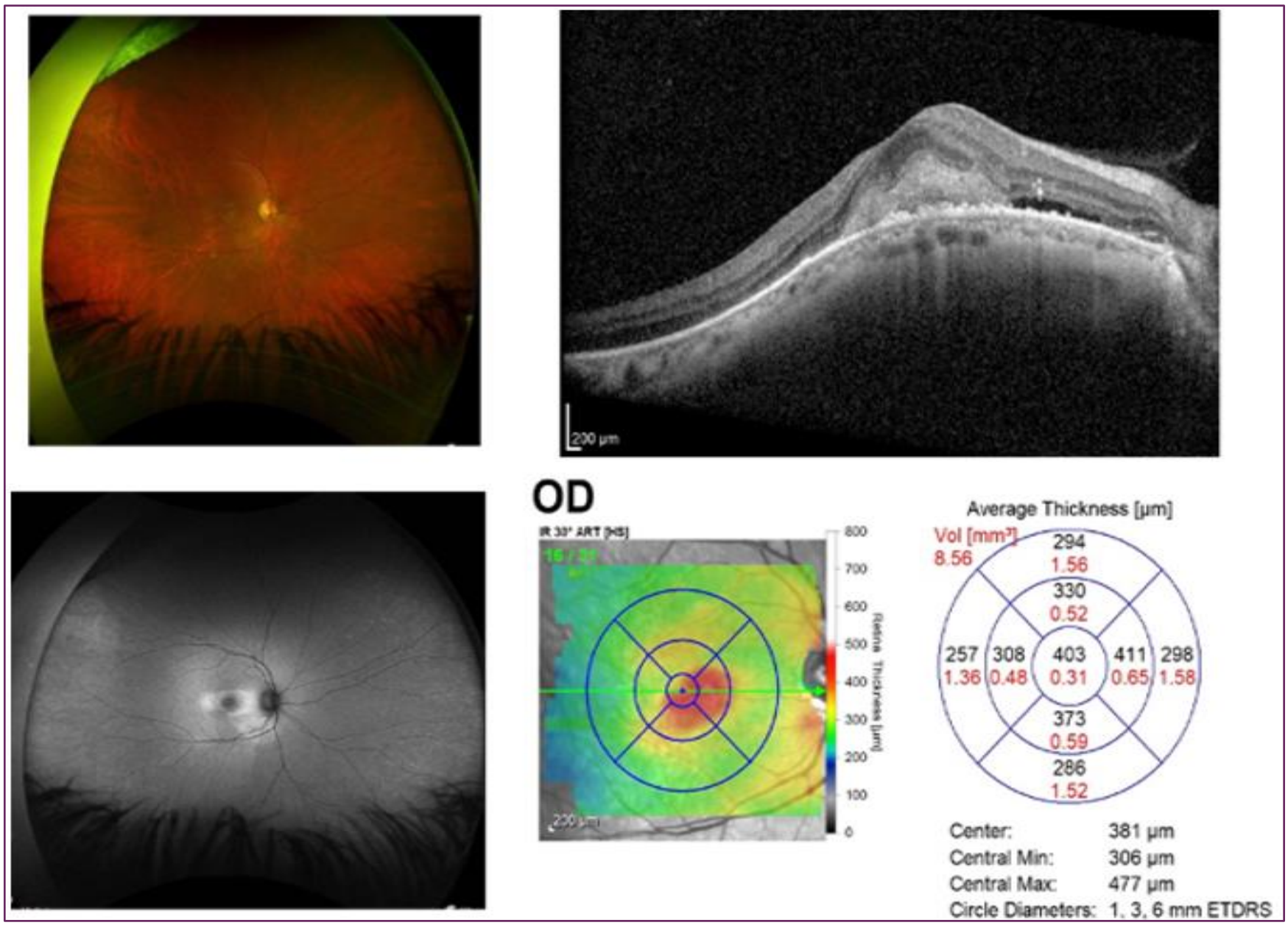

Figure 3: Right Eye Result After the Second Injection.

To date, the patient has received a total of four intravitreal injections, with three administered within a one-month interval and one administered within a two-month interval. She is scheduled to receive her fifth intravitreal injection later in 2023 and her latest tomography scans are shown in **[Figure 4]**.

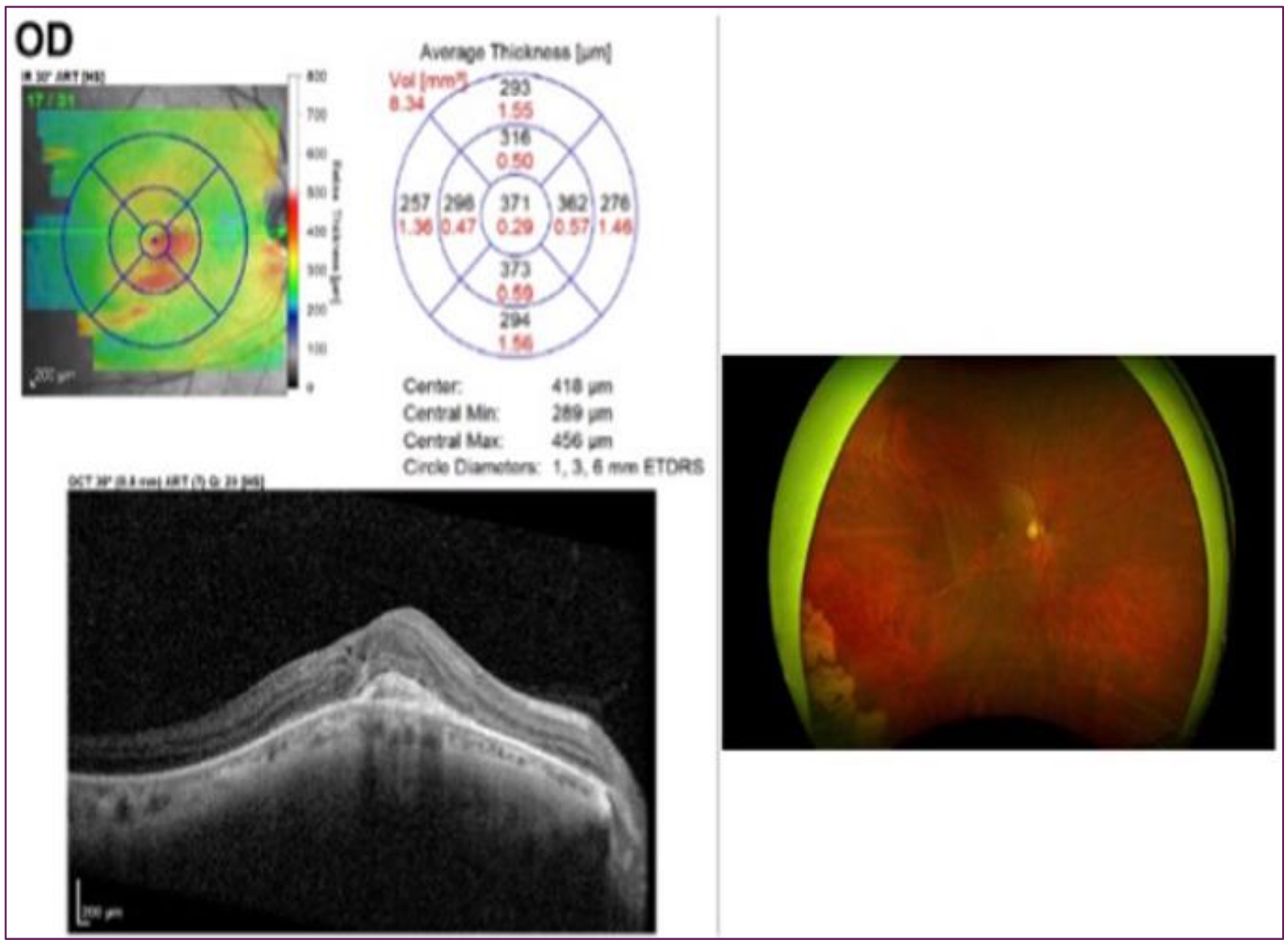

Figure 4: Most Recent Tomography.

The doctor advised the patient to have a tomography scan every two months to monitor her progress and ensure the improvement of her vision. The patient's vital signs were within the normal range during all visits.

Discussion

Acute-onset vitreous hemorrhage (VH) is a rare but potentially serious ocular condition that affects 7 per 100,000 individuals. VH can be caused by both traumatic and non-traumatic factors, with the most common non-traumatic causes including diabetic retinopathy (DR), posterior vitreous detachment with or without retinal tear, vascular proliferation following retinal vein occlusion (RVO), and age-related macular degeneration (AMD) in patients older than 60 years of age. Traumatic VH can occur as a result of blunt or penetrating trauma, particularly in male patients under the age of 40 **[4-7]**.

The diagnosis of VH is often made through exclusion, with DR being suspected if the patient has a history of diabetes, RVO if DR is excluded, and then retinal breaks or AMD **[8]**. In this case, the VH occurred in the right eye of a 51-year-old female patient with scotoma, no past medical or surgical history, and no history of trauma. Additionally, the patient had previously been infected with the coronavirus four months prior and had received three doses of the COVID-19 vaccine: 2 AstraZeneca and 1 Pfizer-Biotech.

It is noteworthy that the temporal relationship between the development of VH and the second dose of the COVID-19 vaccine is worth considering, though it is not possible to determine a causal relationship from this case alone. While it is not unreasonable to assume that the VH is a condition that arises from DR or as a complication of COVID-19 disease **[9]**. In this case, the patient was not diabetic and the temporal relationship between the development of VH and the second dose of the COVID-19 vaccine is worth considering.

The recommended treatment for non-traumatic VH is intravitreal injection of antiangiogenic drugs to help clear the vitreous cavity. Vitrectomy may be considered in specific cases of non-traumatic VH **[10]**. In this case, the patient received five intravitreal injections and showed improvement in symptoms.

It is important to note that while this case report presents an interesting association between VH and COVID-19 vaccination, it is not possible to establish a causal relationship from this single case alone. Further research is needed to determine the incidence of VH in non-diabetic COVID-19 patients and to evaluate any potential risk factors for the development of this condition. Additionally, it is important for healthcare providers to be aware of the potential for VH in patients who have been vaccinated for COVID-19 and to consider this diagnosis in patients with symptoms of VH.

In conclusion, this case report highlights the importance of close monitoring and follow-up in patients with VH, particularly in the context of a COVID-19 vaccination. Further studies are needed to determine the incidence and

potential risk factors of VH in non-diabetic COVID-19 patients, and routine checkups are advised to prevent VH.

Conclusion

In conclusion, this case report highlights a rare and unique presentation of acute-onset vitreous hemorrhage (VH) in a non-diabetic patient with a history of COVID-19 infection and vaccination. The temporal relationship between the development of VH and the second dose of the COVID-19 vaccine is worth considering, though it is not possible to determine a causal relationship from this case alone. Further studies are needed to investigate the incidence and potential risk factors of VH in non-diabetic COVID-19 patients, and routine ocular checkups are advised to prevent VH complications. The current COVID-19 pandemic has highlighted the need for more research on the impact of the virus on various organs, including the eyes. It is important to recognize that VH, especially idiopathic vitreous hemorrhage (IVH), may be associated with COVID-19 vaccination or the virus itself, as this knowledge can aid in the early detection and prevention of eye hemorrhage complications.

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Declaration of competing interest: The authors declare no conflicts of interest.

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