Case Report

Post COVID Central Retinal Vein Occlusion in a Young Woman with Well-controlled Diabetes

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Central Retinal Vein Occlusion (CRVO) is one among the many causes leading to high degree of visual impairment and blindness in the adult population. There is a likelihood of overlooking Cardiovascular complications when the patient is young and the diabetes is well controlled. Here we present a case of unilateral CRVO in a young lady who has well-controlled Type 2 Diabetes and a history of COVID 3 weeks back. This is to report the possibility of the occurrence of CRVO even in a patient with well-controlled Diabetes in the Post COVID phase and to keep in mind the differential diagnosis of sudden unilateral visual loss.

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Key words **: Young Diabetes, Central Retinal Vein Occlusion (CRVO), Post COVID, Hypercoagulability.**

The global prevalence of diabetes was estimated to be 9.3% (463 million people) in 2019, increasing to 10.2% (578 million) by 2030 and 10.9% (700 million) by 2045. Retinal Vein Occlusion (RVO) occurs infrequently in patients with diabetes. Although the etiology is not clear, it could be related to other microvascular complications and diabetes could be taken as a risk factor for RVO[1].

Central Retinal Vein Occlusion (CRVO) is commonly associated with atherosclerotic risk factors like diabetes, hypertension and age >55 years; other associations being chronic glaucoma, hyper viscosity, coagulopathy and migraine[2]. The exact reason for occlusion of the retinal vein is often not clear. There may be a severe loss of vision but the onset is typically subacute. When venous stasis is severe, it may lead to infarction due to slowed renal arterial blood flow.

Thromboembolic complications are known to occur in COVID-19. The prevalence of venous thromboembolic events in critically ill COVID patients has been found to be high. Retinal microangiopathic changes have been observed but it is not clear if these are due to prolonged hypoxemia or are related to a more direct viral etiology[3]. Though no large-scale studies have been performed to establish the causal relationship, several cases of CRVO have been reported in COVID[4]. A panel of blood tests are usually done in individuals younger than 56 years with newly diagnosed venous occlusion[5], as younger patients are more likely to have an identifiable cause for their hypercoagulability[6].

Case Report

A 45-year-old Asian Indian female presented to the diabetic clinic with history of loss of vision in her left eye for last 2 days. She was diagnosed to have Type 2 Diabetes Mellitus (Type 2 DM) 4 years back from our clinic and she has been under regular follow up since then. She was a college lecturer and was meticulous in her diet and exercise and almost fully compliant with her medications. She was on a combination of vildagliptin + metformin (50 + 500) twice daily and had a good glycemic control. Her blood values done 1 week back were FBS 99mg/dl, 2 hours PPBS 168mg/dl and HbA1C 6.9. She was not overweight and had a BMI of 21. She was normotensive and there was no dyslipidaemia. She did not have any addictions.

Editor's Comment :

- COVID-19 has been known to cause thrombotic events.
- This case highlights the importance of recognizing CRVO as an important complication of COVID.
- Treating Physicians should not overlook this possibility even in the absence of traditional risk factors.

Vital signs on presentation –

Pulse	- 72 bpm regular
BP	-120/82 mm of Hg
Respiratory rate	-16 breaths/minute
Temperature	- 97° F Afebrile

Physical examination was unremarkable. Cardiovascular system examination was normal and there was no focal neurological deficit.

ECG showed sinus rhythm and blood sugar at presentation Random Blood Sugar (RBS) was 156 mg/dl.

Differential diagnosis considered were Branch Retinal Vein Occlusion (BRVO), CRVO, Branch Retinal Artery Occlusion, Central Retinal Artery Occlusion, Papillitis, Vitreous Haemorrhage and Retinal Detachment.

An emergency Ophthalmology consultation was sent, and a detailed Ophthalmology evaluation was done.

Ophthalmologic evaluation demonstrated a best corrected visual acuity of 6/9 in left eye and 6/6 in right eye. Pupil examination revealed a sluggishly reactive pupil on the left side and a normally reactive right pupil. There

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was no evidence of Relative Afferent Pupillary Defect (RAPD).

The intraocular pressure was 16mmHg in the left eye, and in the right, it was 14 mmHg.

A Slit lamp examination revealed normal anterior segments with open angles on both sides.

Fundus evaluation of left eye showed disc oedema, dilated and tortuous retinal veins, with intraretinal haemorrhages all over the posterior pole with Macular Oedema (MO) (Fig 1). Fundus evaluation of the right eye demonstrated a normal optic disc with a cup to disc ratio of 0.4 and flat macula and no evidence diabetic retinopathy.

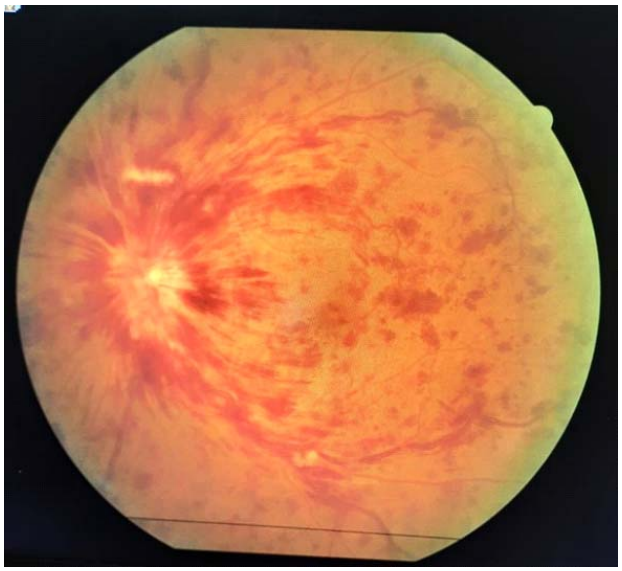

Fig 1 — Fundus Photograph

Optical Coherence Tomography (OCT) showed spongy Macular Oedema with loss of foveal contour (Fig 2).

Patient was diagnosed with unilateral non ischemic central retinal vein occlusion in the left eye.

Laboratory tests including complete hypercoagulability and thrombotic workup was done (Tables 1 & 2).

As the patient had Macular Oedema (MO), she was

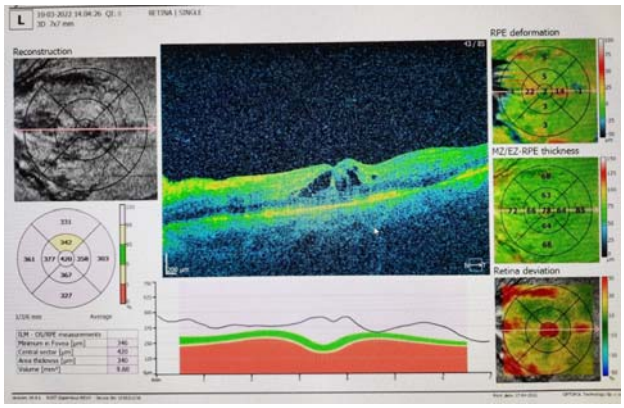

Fig 2 — Optical Coherence Tomography

Table 1

CBC with ESR	Hb 12.2 TC 8000 Platelet 1.9lakhs HCT 40 ESR 8
HbA1C	6.9
PTINR	Normal INR 0.9
APTT	Normal
S Cr	0.8mg/dl
CRP	6 (Normal)
SARS CoV IgG antibody	Positive
IgM antibody	Negative
D-dimer	690ng/ml (Normal <500)
Fasting lipid profile	Normal
ANA	Negative
Rheumatoid factor	Negative
VDRL	Negative
FTA-ABS	Negative
HIV	Negative
Serum protein electrophoresis	Normal
Haemoglobin electrophoresis	Normal

Table 2

Serum homocysteine	Normal
Folate level	Normal
B12 level	Normal
Antiphospholipid antibody titre	Not raised
Anticardiolipin antibody	Negative
Lupus anticoagulant	Negative
Functional protein C assay	Normal
Functional protein S assay	Normal
Functional antithrombin III assay	Normal
Factor V Leiden PCR assay	Negative

initiated on intra vitreal anti-VEGF (Vascular Endothelial Growth Factor) injection (Ranibizumab) with a plan to give 3 monthly doses watching for improvement in Macular Oedema and visual acuity.

The patient was started on dual antiplatelets (aspirin 75+clopidogrel 75), her anti diabetic medications were continued with good glycaemic control and she was advised close follow up for the next 6 months to check for neo-vascularisation.

Discussion and Conclusions

Young patients in the age group of 40-49 years, have an approximate global prevalence of 0.44% for Retinal Vein Occlusion (RVO)[7]. In most cases, the causative factors for RVO among the younger population is still not clear. A cohort study of 69 young CRVO patients with age <50 showed hypertension (44%), dyslipidaemia (38%) and diabetes (23%) to be the common comorbidities[8]. Though unproven, a role for dehydration in some cases has been suggested[9].

A high proportion of patients in this age group have a benign course, with spontaneous regression being more likely. Young patients with CRVO tend to have a lesser requirement for intravitreal anti Vascular Endothelial Growth Factor (VEGF) for Macular Oedema[10]. Nevertheless, poor visual outcome with severe neovascular complications can occur in around 20% of patients[6]. RVO Consultation Document, 2021 states that, if there is no evidence of neo-vascularisation or Macular

Oedema and if visual acuity is above 6/12, the patient may be observed for spontaneous regression as per the discretion of the treating Consultant.

In accordance with European Society of Retina (EURETINA) guidelines, anti VEGF are the agents of choice for the treatment of MO due to CRVO. Ranibizumab, a pan VEGF-A humanised recombinant monoclonal antibody fragment is approved by European Medicines Agency (EMA) and recommended by National institute for Health and Care Excellence (NICE) for the treatment of RVO with secondary macular oedema.

For Non-ischemic CRVO, for the first 6 months, follow up every 3 months is approved in eyes not requiring treatment. As per RVO Consultation Document 2021, Ophthalmology follow up is advised for at least 18 months even if no intervention is required from the last intravitreal therapy.

Here the diabetes was well controlled, and the coagulation work up was unremarkable except for a slightly raised D dimer which could represent an increased tendency to blood clots Post COVID. This case illustrates a scenario of unilateral CRVO where diabetes and Post COVID state are thought to be the major risk factors. Close follow up was advised to look for signs and to investigate for any neo-vascularisation.

Declarations : Institutional Ethics Committee approval was obtained for the Case Report and informed consent of the patient was obtained. There is no external funding and no competing interest.

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