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A CURIOUS CASE OF CENTRAL RETINAL VEIN OCCLUSION IN A YOUNG PATIENT FOLLOWING DENGUE FEVER

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Abstract

Introduction: *Central retinal vein occlusion (CRVO) is a common ocular disease which can be responsible for significant ocular morbidity in the adult population. It is most commonly associated with lifestyle diseases especially hypertension in older age groups, but may have a variety of etiologies including genetically inherited disorders.*

Case report: *A 27-year-old female patient presented to our out patient department (OPD) with history of diminished vision in left eye of 03 days duration. The patient gave history of contracting dengue fever three weeks prior to the onset of symptoms. On evaluation she was found to have CRVO of the left eye with no macular edema. The patient was investigated for other causes of CRVO and was found to have mildly reduced serum homocysteine and deranged serum iron studies. The patient was managed conservatively with good visual recovery and is presently on follow up for early detection of complications for CRVO.*

Discussion: *The patient presented with multiple etiologies of CRVO, however, each was subclinical in nature. Conservative management for ocular symptoms along with treatment of systemic deficiencies by the physician lead to good visual outcome and generalized well being of the patient.*

Conclusion: *CRVO is being increasingly seen in the younger age group. Multiple etiologies may need to be ruled out, along with lifestyle diseases which are on an incline in the younger population. Close follow up with treatment is required to detect complications early, and provide a good visual outcome. To our knowledge, this is the third reported case of CRVO related to dengue fever.*

Keywords: CRVO, dengue, homocysteine, carotid doppler

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INTRODUCTION

Central retinal vein occlusion (CRVO), an obstruction of the central retinal vein posterior to the lamina cribrosa, is a common disease causing significant ocular morbidity. It is the second most common retinal vascular disease after diabetic retinopathy.[1] It is generally seen in older adults, predominantly over 60 years of age, where the most common causes are hypertension, diabetes mellitus and dyslipidemia, with smoking being an important risk factor.[2] Its prevalence is on a gradual incline in the younger population,where a multitude of other etiologies and risk factors must be ruled out for effective treatment and prevention of potentially devastating systemic sequelae.[3] When associated with macular edema, the mainstay of treatment is intravitreal injection of anti- vascular endothelial growth factor (VEGF). There is also need for close follow up for detection and treatment of any sequelae such as neovascularization and glaucoma[4]. We present a case report of a young female patient with unilateral CRVO and the suspected etiologies uncovered during her evaluation and management.

CASE REPORT

History: A 27 year old female patient presented to our Eye out patient department (OPD) with history of diminished vision in the left eye of 3 days duration. It was sudden in onset, painless and non progressive. There was no history of trauma, redness, discharge, diplopia or metamorphopsia. She gave history of suffering from fever 3 weeks prior to onset of symptoms, which was diagnosed as dengue fever and was managed conservatively. The patient had not developed thrombocytopenia or any hemorrhagic manifestations during the course of the disease.The patient had no known systemic comorbidities. She had two healthy issues, a three year old and a six month old child, and was not on any oral contraceptive medication. On specific questioning she gave family history of hypertension, cardiovascular and cerebrovascular ailments.

Clinical examination: The patient's unaided distant visual acuity with Snellen's acuity chart was 6/6 in right eye and 6/9 in left eye. Intraocular pressure was normal in both eyes. The anterior segment and fundus examination of the right eye were within normal limits. The left eye showed a grade 1 RAPD, rest of the anterior segment examination was normal. Fundus examination revealed an edematous optic disc with hemorrhages at the disc, tortuosity of the retinal veins with multiple flame-shaped intraretinal hemorrhages along the vascular arcades and cotton wool spots in all quadrants affecting the posterior pole and mid-periphery. There were a few dot hemorrhages at the macula, however, the fovea appeared normal with no obvious subretinal fluid (SRF). The clinical picture was suggestive of central retinal vein occlusion left eye [Fig 1]. Another important differential diagnosis that was considered in this case was optic neuritis of the left eye, primarily due to grade 1 RAPD and

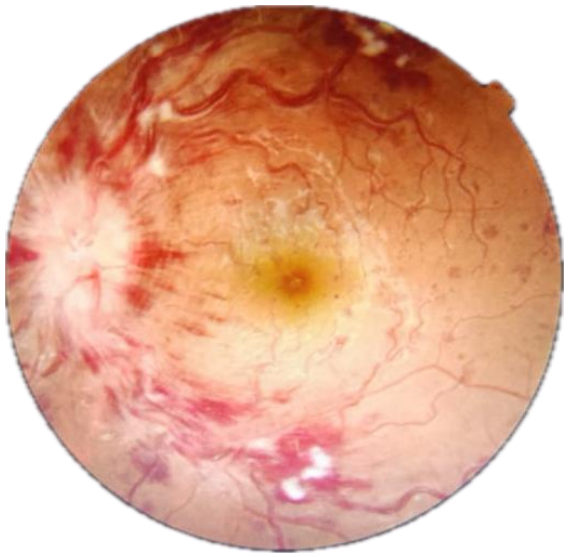

Fig 1: Colour fundus photograph of the left eye showing disc edema with disc and intraretinal hemorrhages, cotton wool spots and vascular tortuosity.

disc edema. However, it was clinically ruled out due to the absence of ocular pain or painful eye movements, and associated significant retinal hemorrhages and exudates along with vascular tortuosity.

Investigations: OCT macula revealed a normal foveal contour in both eyes. Central macular thickness (CMT) was 239 microns and 260 microns in the right and left eyes respectively with no evidence of macular edema [Fig 2].

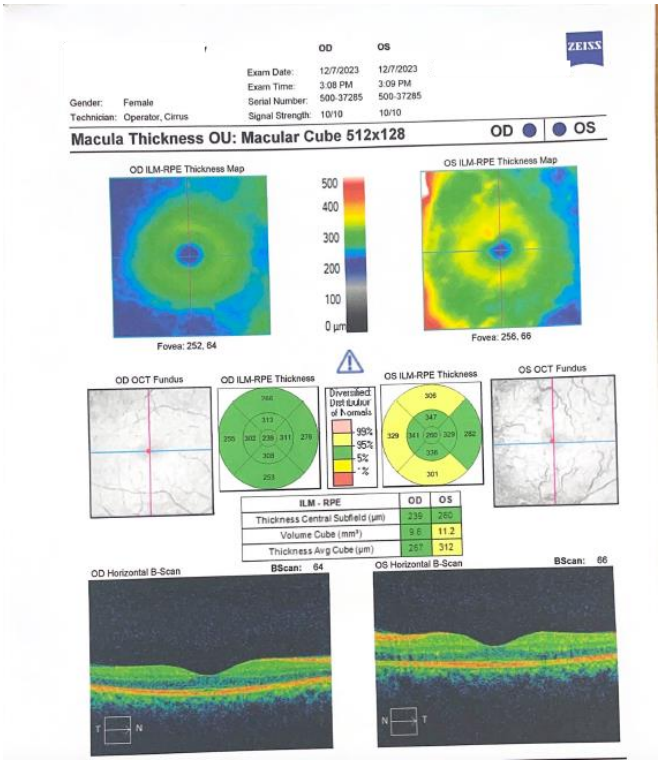

Fig 2: OCT macula showing a normal foveal contour and normal CMT in both eyes.

Systemic investigations: Keeping in mind the young age of the patient, a series of investigations to determine the etiology of CRVO. Complete blood count revealed a hemoglobin level of 10.7 mg/dl with a normal hematocrit and platelet count. Bleeding time (BT), clotting time (CT), prothrombin time (PT) and international normalized ration (INR) were normal. The C-reactive protein (CRP) and Dengue IgG levels were raised. Serum homocysteine levels were moderately elevated (17.46 µmol/L). Serum angiotensin converting enzyme (ACE), Protein C, Protein S, viral markers were within normal limits. Serum folic acid and serum cyanocobalalmin levels were normal. Serum iron studies revealed a reduced serum iron level (25 µg/dl) and transferrin saturation (5.90%) with normal total iron binding capacity (TIBC). Bilateral carotid doppler ultrasound revealed no abnormality. MRI brain and orbits were within normal limits in both eyes, thereby ruling out optic neuritis.

Management and follow up: The patient was managed as a case of CRVO right eye. Since there was no macular edema at presentation and visual acuity was good, the patient was managed conservatively with regular follow up, monitoring of visual acuity and IOP and fundus examinations. Presently the patient has improved clinically and the visual acuity in the left eye has improved to 6/6(P). She is under regular follow up at our centre to rule out delayed complications of CRVO.

DISCUSSION

CRVO is the second commonest vascular pathology of the retina and is an important cause of ocular morbidity in the community.[1] The disease can affect any age group, though the etiology tends to vary among younger and older population. In the older population (>60 years), the etiology is mostly related to lifestyle diseases such as hypertension, diabetes mellitus and dyslipidemia, with smoking being an important risk factor.[2] The younger population requires a more comprehensive investigation for the cause. Most common factors are hyperhomocysteinemia, thrombophilic states such as Protein C, Protein S deficiency, factor V Leiden mutation.[5] Iron deficiency anemia and severe dehydration are also known to play a role.[6,7] Drugs, most significantly oral contraceptive pills (OCPs) can be an important risk factor in young female patients.[8] Systemic diseases like systemic lupus erythematosus (SLE), sacroidosis, rheumatoid arthritis, systemic vasculitis, multiple myeloma, infections such as syphilis, HIV, hepatitis have also been implicated in the disease.[9] Ocular risk factors such as glaucoma, short axial length also predispose to CRVO.[9] The role of antiphospholipid antibody (APLA) is not well established.[10] In general, CRVO in young is broadly classified as that occurring in patients less than 50 years of age.[2]

CRVO is broadly divided into ischemic and non-ischemic. Ischemic CRVO is occlusion just posterior to lamina cribrosa and is characterized by more severe signs and symptoms such as poorer visual

acuity, higher grade of RAPD, more severe retinal findings including hemorrhages, soft exudates, disc and macular edema, and an overall poorer prognosis, when compared to non ischemic variant. Non-ischemic CRVO is characterized by occlusion further behind the lamina cribrosa, providing a chance for collateral vessels to form.[9]

Dengue fever has been known to cause ocular complications, mainly involving the posterior segment. The clinical features range from uveitis, periphlebiltis, macular edema to retinal venous occlusions.[11] As per our literature search, only two cases of central retinal vein occlusion following dengue fever have been reported in literature. Preechawat et al reported a case of CRVO following dengue fever in 2012, while Velaitham P and Vijayasingham N reported a case of CRVO concomitant with dengue fever in 2016.[12,13] A case of branch retinal vein occlusion secondary to dengue fever was reported in 2008 by Kanungo et al.[11] The exact pathogenesis of venous occlusion following dengue is unknown, and has been hypothesized to be related to downregulation of antithrombin from multiple mechanisms, including downregulation of protein C pathway in vascular endothelium, or increase in plasma levels of plasminogen activator inhibitor type 1 (PAI-1).[13]

Our patient was a young lady with history of dengue fever followed by CRVO in left eye. On investigation, she was found to have mildly raised serum homocysteine levels and anemia. Rest of the blood investigations and carotid doppler were normal. The patient had a six month old daughter and was not on OCPs. Therefore there were multiple factors which could be attributed to the cause of CRVO in this patient. However, the marginal rise in homocysteine level in the presence of normal folic acid and cyanocobalamin levels was deemed not significant enough to cause occlusion. The clinical picture also supported the diagnosis of CRVO over anemic retinopathy. Hence dengue fever was attributed as the most likely cause of CRVO in this patient, probably augmented by iron deficiency anemia.

The treatment of CRVO depends on the clinical profile. In the presence of macular edema, anti-VEGF intravitreal injections (ranibizumab, aflibercept) are the first line of treatment. Intravitreal steroid (dexamethasone implant) can be used in cases resistant to anti-VEGF treatment.[4] In the absence of macular edema though, observation remains the treatment of choice. CRVO has a strong tendency to lead to early neovascularization, and has been known to be associated with neovascular glaucoma as a late complication.[9] Hence, a very close observation, with regular dilated ophthamoscopy is important for the patient. A fundus fluorescein angiogram can be taken on once the retinal hemorrhages start to resolve, to help in detection of neovascularization. Prompt retinal photocoagulation should be taken on detection of retinal neovascularization to prevent vitreous hemorrhage and glaucoma.[9] With close observation and prompt

treatment, patient may have a fair to good visual prognosis. Since our patient was evaluated with three days of onset of symptoms, with a good visual acuity at presentation and no macular edema or neovascularization, she is being managed with close observation at present.

CONCLUSION

CRVO is a relatively uncommon ocular manifestation of dengue fever and may be an important complication to look out for during or after the course of the illness. It can affect any age group and can lead to permanent vision loss. An early diagnosis and management, however, can prevent complications and lead to good visual outcome. We report this case to highlight the potential ocular complications of dengue fever. To our knowledge, this is the third case of CRVO associated with dengue fever reported in literature.

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