Central Retinal Vein Prethrombosis Secondary to Retinal Vasculitis: Early Detection and Treatment

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Abstract:
The aim was to report a case of central retinal vein prethrombosis (CRVP), responsive to systemic steroids. An 18-year-old male presented with right sudden blurred vision and central scotoma for 2 days. Right best-corrected visual acuity (BCVA) measured 6/36, and fundoscopy revealed vascular congestion and blurred disc margins. Fluorescein angiography (FA) showed CRVP secondary to retinal vasculitis. Systemic oral prednisone was started. Six months later, right BCVA was 6/6, FA showed reduced vascular congestion, and retinal vasculitis and residual optic disc hyperfluorescence resolved. CRVP should be considered in young patients with sudden central scotoma. Early systemic steroids might be effective in the treatment of “active” retinal vasculitis.

Keywords:
Central retinal vein occlusion, central retinal vein prethrombosis, fluorescein angiography, papillophlebitis, retinal vasculitis

Introduction

Central retinal vein occlusion (CRVO) typically occurs in elderly patients with underlying vascular diseases or procoagulant states, and it rarely occurs in young adults. Hypertension, diabetes, vasculitis, and dyslipidemia are the most commonly associated vascular disorders, while recognized procoagulant states include thrombocytosis, polycythemia, macroglobulinemia, oral contraceptives, and systemic lupus erythematosus.[1]

Retinal vasculitis (RV) is a potentially sight-threatening inflammatory eye condition with diverse etiology that involves retinal vessels. Although commonly idiopathic, it may occur as a complication of infective or neoplastic disorders, or in association with systemic inflammatory diseases. Typical signs and symptoms include blurred vision, central scotoma, micropsia and metamorphopsia when the macula is affected, and vitreous floaters and phosphenes when the vitreous is involved. Detection of RV is made clinically and confirmed with fluorescein angiography (FA).[2] Treatment of RV includes systemic steroids, immunosuppressive agents, topical mydriatic, and cycloplegics.[3]

We report an unusual case of central retinal vein prethrombosis (CRVP) secondary to RV, presenting in an 18-year-old patient with anamnesis negative to all classic risk factors for CRVO, responsive to systemic steroids.

Case Report

An 18-year-old male presented with right eye sudden decrease in vision, phosphenes, and central scotoma for 2 days. The patient was in good health taking no medications, and he had no personal or family history of eye diseases, thrombophilia, hypertension,
smoking, diabetes mellitus, dyslipidemias, and open-angle glaucoma. Right best-corrected visual acuity (BCVA) was 6/36; there were no relative afferent papillary defect, fever, or any other systemic complaints; and color vision tests and intraocular pressures were normal in both eyes. Right fundoscopy showed increased congestion of retinal vessels, dilated and tortuous retinal veins, and blurred disc margins [Figure 1a]. Spectral domain-optical coherence tomography (SD-OCT) showed increased macular thickness with moderate level of intraretinal and subretinal fluid [Figure 1b], and 24-2 visual field showed multiple paracentral defects in all the quadrants [Figure 1c]. Full blood count; serum electrolytes; kidney and liver function tests; and serology for hepatitis B and C, HIV, varicella zoster virus, herpes simplex 1 and 2 viruses, Cytomegalovirus, Epstein–Barr virus, syphilis, tuberculosis, Bartonella and Afipia felis, and toxoplasmosis was negative. Erythrocyte sedimentation rate and C-reactive protein were normal; tests for serum autoantibodies, including antinuclear antibody, anti-DNA, perinuclear (p) and cytoplasmic anti-neutrophil cytoplasmic antibodies, antitymoperoxidase antibodies, and human leukocyte antigen (HLA)-B51, were negative. Coagulation tests, including activated protein C resistance, protein S, antiphospholipid antibodies, lupus anticoagulant and serum homocysteine, partial thromboplastin time, and prothrombin time, were normal, and no factor V Leiden mutation was detected. Bilateral visual-evoked potentials were normal; right electroretinogram showed mild reduction of b-wave amplitude; and right FA revealed increased vascular congestion, delayed retinal perfusion and arterovenous filling, perivascular staining, and late disc hyperfluorescence [Figure 1d]. Right eye CRVP secondary to idiopathic RV was diagnosed, and systemic oral prednisone (1 mg/kg/die) was started. At 2 weeks, right BCVA was 6/9, no phosphenes and central scotoma were reported, and systemic steroids were rapidly tapered down. At 3 months, right BCVA was 6/6; right FA showed marked reduced vascular congestion and reduced optical disc hyperfluorescence [Figure 2a]. At 6 months, right BCVA was 6/6; right FA showed reduced vascular congestion, resolved perivascular staining, and mild residual optic disc hyperfluorescence [Figure 2b]; and SD-OCT showed normal central macular thickness, resolution of intraretinal and subretinal fluid, and restoration of normal foveal profile [Figure 2c].

Discussion

CRVO is usually seen in older adults and is often associated with systemic vascular diseases; 51% of cases occur after 65 years of age, and the incidence in 70–79-year-old is threefold higher than that in those aged 50–59 years. CRVO can be seen in young adults, and although it is occasionally associated with systemic diseases, it mostly occurs in an otherwise healthy patient with no known risk factors. Inflammation of the central retinal vein has been proposed as a cause of CRVO in young adults, thus it has been called papillophlebitis. Because the fundus appearance in papillophlebitis is similar to CRVO, the term papillophlebitis – instead of CRVO – has been used for young patients; “retinal vasculitis” and “benign disc vasculitis” are synonymous terms for “papillophlebitis.” Although most eyes

![Figure 1](image1.png)

**Figure 1:** (a) Color fundus retinal photography showing increased congestion of retinal vessels, dilated tortuous retinal veins, few spotty flame-shaped intraretinal hemorrhages, and blurred disc margins in the right eye. (b) Spectral domain-optical coherence tomography horizontal scan at presentation, showing increased macular thickness with moderate level of intraretinal and subretinal fluid. (c) 24-2 visual field test, showing multiple paracentral defects in all the quadrants. (d) Fluorescein angiography showing increased vascular congestion, delayed retinal perfusion and arterovenous filling, perivascular staining, and late disc hyperfluorescence in the right eye.

![Figure 2](image2.png)

**Figure 2:** (a) Fluorescein angiography at 3-month follow-up showing reduction of the optic disc hyperfluorescence and marked reduction of vascular congestion in the right eye. (b) Fluorescein angiography at 6-month follow-up showing further mild residual optic disc hyperfluorescence, resolved perivascular staining, and some vascular telangiectasias in the upper retinal quadrants in the right eye. (c) Spectral domain-optical coherence tomography horizontal scan at 6-month follow-up, showing normal central macular thickness, resolution of intraretinal and subretinal fluid, and restoration of normal foveal profile.
recover vision to more than 6/12, about one-fifth have significant visual loss, and many suffer ocular sequelae. CRV inflammation at the optic disc has been suggested as a possible cause, but the source of this inflammation is unknown and may result in disc edema and venous occlusion. RV has been associated with ocular infections and inflammatory syndromes, nonvasculitic systemic inflammatory diseases, underlying systemic vasculitis, acute leukemia, and malignancy-related retinopathy.[4] Evidence indicates that noninfective RV is an autoimmune condition that may be induced by antecedent infection with microbes cross-reacting with putative autoantigens, influenced by genetic susceptibility of both HLA associations and cytokine polymorphisms.

There are no specific treatment protocols for RV, which is basically a CRVO occurring in young adults.[5] As the clinical course of papillophlebitis is typically without permanent visual loss and spontaneous improvement is common, patients are usually not treated. However, up to 30% of patients develop ischemic venous occlusion,[6] final BCVA may decrease to 6/60 or worse, and neovascular glaucoma may develop.[6] Clinically significant cystoid macular edema is an indication to treatment, and benefits from systemic corticosteroids have been previously reported, but these results are unverified.[5,7] Güngör et al. report increase of BCVA in a 14-year-old patient with papillophlebitis treated with a single intravitreal ranibizumab injection and oral prednisolone.[5]

In our case, the screening for thrombophilia and infectious diseases and immunological tests were negative, and CRVP secondary to idiopathic RV was diagnosed after clinically excluding systemic conditions and supported by negative laboratory tests. Early FA showed the typical pattern of RV, and the early response to corticosteroids highlights the importance of early diagnosis and treatment. In our opinion, a good response to treatment was obtained in a patient with a recent history of RV in active stage. This case makes a compelling argument for a systematic, controlled study of steroids in the treatment of recent “active” RV, however, these should not be started until an infective etiology has been satisfactorily ruled out, and the patient should be closely monitored for relapses in conjunction with rheumatologists.[7]

In conclusion, CRVP secondary to idiopathic RV should be considered in young healthy patients suffering from sudden decreased BCVA. In our case, early systemic steroids were effective. Further studies are needed to evaluate their role in the treatment of “active” CRVP associated with RV.

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Conflicts of interest
There are no conflicts of interest.

References
1. Pierre-Filho Pde T, Pierre AM, Nascimento MA, Marcondes AM. Central retinal vein prethrombosis as an initial manifestation of protein S deficiency. Sao Paulo Med J 2004;122:134-5.
2. Abu El-Asrar AM, Herbort CP, Tabbara KF. Differential diagnosis of retinal vasculitis. Middle East Afr J Ophthalmol 2009;16:202-18.
3. Purvin VA. Optic neuropathies for the neurologist. Semin Neurol 2000;20:97-110.
4. Rosenbaum JT, Ku J, Ali A, Choi D, Suhler EB. Patients with retinal vasculitis rarely suffer from systemic vasculitis. Semin Arthritis Rheum 2012;41:859-65.
5. Güngör İ, Konuk GE, Süllü Y, Arıtürk N. Papillophlebitis: Treatment of vision loss due to subretinal fluid with intravitreal ranibizumab. Neuroophthalmology 2014;38:336-9.
6. Heier JS, Morley MG. Venous obstructive disease of the retina. In: Yanoff M, Duker JS editors. Ophthalmology. London: Mosby International; 1999. p. 8/18.18/8.8.
7. Arnold CA. Ischemic optic neuropathy, diabetic papillopathy and papillophlebitis. In: Yanoff M, Duker JS, editors. Ophthalmology. London: Mosby International; 1999:11/7.511/7.6.