Case Report

Neovascular Glaucoma as a Presenting Sign of Catastrophic Antiphospholipid Syndrome with a “Catastrophic” Heart Valve Finding

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Keywords

Catastrophic antiphospholipid syndrome · SLE · Neovascular glaucoma · Libman-Sacks endocarditis · Vaso-occlusive retinopathy

Abstract

We aimed to describe a case of neovascular glaucoma (NVG) as a first presenting sign of catastrophic antiphospholipid syndrome (CAPS) with heart valve aseptic vegetations known as Libman-Sacks endocarditis. A 39-year-old man was referred for left eye decreased visual acuity and pain, upon examination left eye high intraocular pressure; rubeosis iridis of both eyes (BE); and prominent retinal ischemia. Clinical and fluorescein angiography findings established the diagnosis of left eye NVG with vaso-occlusive disease in BE. Magnetic resonance imaging of the head showed widespread ischemic lesions and hemorrhagic foci. The transesophageal echocardiogram showed 2 big mitral valve lesions consistent with the diagnosis of Libman-Sacks endocarditis. Laboratory and clinical diagnosis of CAPS and suspected SLE was confirmed, and treatment with anticoagulants and IV steroids was initiated. This case demonstrates that severe vaso-occlusive retinopathy with severe brain ischemia should raise the suspicion of systemic autoimmune pro-coagulative diseases with heart valve aseptic vegetations.

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Published by S. Karger AG, Basel

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Introduction

Neovascular glaucoma (NVG) is a condition caused by growth of vessels and the fibrovascular membrane obstructing aqueous outflow and results in a rise in intraocular pressure (IOP). Overall, 95% of NVG cases are mediated by ischemia and hypoxia of the retina.

Catastrophic antiphospholipid syndrome (CAPS) is a severe form of antiphospholipid syndrome (APS), a hypercoagulable state, sometimes secondary to SLE, characterized by diffuse vascular thrombosis, leading to multiple organ failure developing over a short period of time. Rarely, but more frequent with the combination of SLE and APS, aseptic thrombotic heart vegetations may develop and cause a “shower” of emboli spreading to the brain and eyes. Herein, we present an unusual case of a patient who developed NVG as the first presenting sign of CAPS with Libman-Sacks endocarditis.

Case Report

A 39-year-old man arrived at our emergency room, reporting a day of blurry vision and severe pain in his left eye. The patient’s past medical history was remarkable for anxiety and headaches for the last 3 years. Brain computed tomography and brain magnetic resonance imaging (MRI) were interpreted as normal.

Upon examination, visual acuity of the right eye (RE) 6/6 and left eye (LE) counting fingers (CF). The left pupil was fixed and mid-dilated, and the reverse relative afferent pupillary defect test was negative. Right IOP was 16 mm Hg, and left IOP was 56 mm Hg. Left hyperemic conjunctiva, edematous cornea, and rubeosis iridis in both eyes (BE) were noticed. After lowering the pressure in the left eye and resolving the corneal edema, gonioscopic examination revealed an open angle in the RE and 120 degrees of synechia in the LE. Fundus examination showed normal disc appearance with evidence of prominent retinal ischemia in the LE more than that in the RE (shown in Fig. 1a). Fluorescein angiography showed a severe bilateral vaso-occlusive retinopathy (shown in Fig. 1b). Diagnosis of LE NVG with vaso-occlusive disease in BE was established. Drug treatment for lowering pressure was started, followed by BE treatment with bevacizumab injections and pan-retinal photocoagulation.

During his hospitalization, we noticed difficulty walking (ataxic gait) and psychomotor retardation; hence, brain MRI was ordered. MRI of the head showed widespread subacute and chronic ischemic lesions and hemorrhagic foci in the white matter of both hemispheres (shown in Fig. 2).

Transthoracic echocardiography and computed tomography angiography were carried out in order to identify the embolic source and were interpreted within normal limits. Trans-esophageal echocardiography (TEE) as a more sensitive test was ordered.

Simultaneously, profound laboratory evaluation was taken, with results revealing acute kidney injury, thrombocytopenia, positive antinuclear antibody, and positive APS antibodies (anticardiolipin, beta-2 glycoproteins, and lupus anticoagulant). A diagnosis of suspected SLE with secondary APS was confirmed, and treatment with anticoagulants and IV steroids was initiated.

While upon treatment, there was no improvement of his functioning and cognitive state. Two days later, TEE was done and showed 2 big lesions on the mitral valve (0.8 and 0.5 mm), thought to be vegetations (shown in Fig. 3). Infectious endocarditis was culturally and serologically ruled out, and a diagnosis of Libman-Sacks/aseptic endocarditis was established.

To this day, he is under ophthalmological, rheumatological, cardiological, and neurological follow-up. In a 1-year follow-up in our department, there was full regression of the

Fig. 1. a Color image: BE sclerotic vessels with plaques peripheral to the major arcades, cotton wool spots and few intraretinal hemorrhages. **b** Fluorescein angiography image: widespread capillary nonperfusion with relative posterior pole sparing, more severe in the right eye. BE, both eyes.

neovascularization in the retina and the iris, with target IOP achieved with topical treatment only.

Discussion

We present a rare and unusual case of NVG as a presenting sign of suspected SLE (biopsy is required) with secondary CAPS and Libman-Sacks endocarditis. SLE is an autoimmune disease which affects multiple organs. Ocular involvement of SLE is observed in about 30% of patients. Retinopathy, the second most common ocular manifestation in SLE, may occur in one of the three following forms: microangiopathy, vasculitis, or – as in our patient – vaso-occlusive disease [1]. SLE vaso-occlusive retinopathy is rare, but in the presence of antiphospholipid antibodies, its prevalence increases four-fold [2].

Our patient was diagnosed with CAPS, the most severe form of APS, manifesting as multiple-vessel thrombi occurring over a short period of time. Not surprisingly, he presented with NVG, a complication of his profound retinal ischemia. But what stood beyond his ocular findings was his neurological impairment. The correlation between neuropsychiatric lupus

Fig. 2. Thin (1 mm) axial T2 flair image (a) of the convexity showing areas of hyperintensity involving both deep and subcortical white matter and the cortex, most likely representing areas of edema and/or gliosis. In the diffusion-weighted images (b), multiple foci of diffusion restriction involving the cerebral cortex were observed, representing subacute lacunar infarcts. In the susceptibility-weighted images (c), multiple low-signal foci, involving the cerebral cortex and subcortical white matter representing foci of the microhemorrhages, were observed.

Fig. 3. Transesophageal echocardiogram demonstrating (white arrows) hyperechoic thickening of the mitral valve with 0.5- and 0.8-cm vegetations.

and retinopathy is described in the literature. It is considered that occlusive lesions or vasculitis, or both, might cause similar damage in the CNS and retinal tissue [3], by saying that in a patient with SLE and retinal involvement, it is advised to look for the CNS involvement.

Our patient's brain imaging demonstrated widespread ischemic lesions and hemorrhagic foci that urged us to look for embolic source, especially considering his lack of clinical and cognitive improvement under immunosuppressive and anticoagulation treatment. TEE

discovered valvular findings that were obscured in the transthoracic echocardiography (which was considered to be less sensitive), hence the importance of transesophageal images in patients with suspected autoimmune disease and CNS manifestations or vaso-occlusive disease. Note that heart valve lesions are found in about 10% of patients with SLE and are more common in patients with SLE and secondary APS than in APS alone; the reason to this may lie in the pathogenesis of these vegetation formation and the combination of thrombotic and inflammatory processes demonstrated via their composition: depositions of platelet thrombi as well as inflammatory molecules like immune complexes [4, 5].

The severe vaso-occlusive retinopathy in our patient can be explained by several mechanisms: first, vasculitis – inflammatory damage to the vascular wall that produces constriction and secondary occlusion; second, CNS thrombi formations that is associated with APS and a hypercoagulable state; last, microemboli from heart vegetations.

In the first 2 mechanisms, we would expect to see a more comprehensive systemic involvement with evidence of multiple-organ vasculitis or thrombi formation. We can assume that in our case of rapidly evolving severe ocular vaso-occlusive disease and diffuse CNS manifestations, heart valve vegetation, which produced “shower” of emboli spreading to the brain and eyes, is the predominant mechanism.

Conclusion

NVG secondary to vaso-occlusive retinopathy, especially in young patients, should raise clinicians’ suspicion of systemic autoimmune pro-coagulative diseases. Heart valvular involvement is common and must be ruled out using transesophageal imaging. Correct diagnosis and prompt treatment are essential in order to prevent further thrombosis, complications, or even death.

Statement of Ethics

The subject of the study has given us a written informed consent to publish his case (including publication of images). This study protocol was reviewed, and the need for approval was waived by the Local Ethical Committee of the Hillel Yaffe Medical Center.

Conflict of Interest Statement

The authors have no conflicts of interest to declare.

Funding Sources

This study did not receive any funding.

Author Contributions

Anya Grinberg, Mohamad Midlij, Beatrice Tiosano, Roni Shreter, and Anat Kessler: contributed to the work design and drafting the work or revising it critically. All of them approved the final version to be published and agreed to be accountable for all aspects of the work.

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