

The central retinal artery occlusion in the right eye followed by a branch retinal artery occlusion in the left eye four days later

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A 65-year-old woman was admitted to our clinic with complaints of sudden, painless, decrease in vision, and sectoral visual field defect in the left eye and later presented to our clinic again with a history of sudden loss of vision in her right eye. In this case study we reported that the patient had branch retinal artery occlusion (BRAO) in the left eye and at the same time progressing central retinal artery occlusion (CRAO) in the right eye.

Key words: Calcified heart valve, emboli, internal carotid artery plaque

Central retinal artery occlusion (CRAO) is a rare event and is found in 1 in 10,000 outpatient visits. Branch retinal artery occlusion (BRAO) is also a rare event, even less common than CRAO overall. While a patient with BRAO appear to have a more benign condition, as compared to patients with CRAO, they should undergo a thorough medical evaluation to establish the cause of obstruction. The BRAO may be the first warning sign of a serious disorder. In this case study, we reported a patient with BRAO in the left eye and at the same time progressing CRAO in the right eye.

Case Report

A 65-year-old woman was admitted to our clinic with complaints of sudden, painless, decrease in vision, and sectoral visual field defect in the left eye for the past 3 days. On examination, the corrected visual acuity by the Snellen chart was 20/40 OS and 20/20 OD. Intra-ocular pressures were 13 mm Hg bilaterally. A relative afferent pupillary defect was observed in the left eye. External and slit lamp examinations were unremarkable in both eyes. Fundus examination of the left eye showed a patchy area of partially faded retinal

whitening in the inferotemporal quadrant of the macula, just encroaching into the fovea. There was an emboli at the disc margin within the inferotemporal artery [Fig. 1a]. Fluorescein angiogram of the left eye showed a delay in arterial filling in the affected vessels [Fig. 1b] and late leakage from the embolus site [Fig. 1c and d]. Confrontation visual field revealed a loss of superior visual field in the left eye. She had a history of uncontrolled hyper-tension and hypercholesterolemia. She had no history of amaurosis fugax, diabetes mellitus, coronary artery disease, or stroke. A fundus examination of the right eye showed an emboli and segmentation in the inferotemporal artery. Due to these findings, cardiology consultation, carotid Doppler ultrasound, echocardiography and blood tests were requested from the patient. Four days after the initial examination, she was presented to our clinic again with a history of sudden loss of vision in her right eye for the last 4 h. Visual acuity in the right eye was reduced to perception of light only. The right eye fundus examination demonstrated a diffuse disc pallor, severe attenuation of retinal arteries, retinal edema, and a “cherry-red spot” appearance on the macula [Fig. 2a]. The red-free photograph greatly accentuates the retinal whitening surrounding the macula and with segmentation of blood columns in inferotemporal retinal artery because of the multiple emboli plaques [Fig. 2b]. She was immediately given a vigorous digital ocular massage, breathing carbogen (95% oxygen, 5% carbon dioxide), started on intra-venous mannitol and systemic carbonic anhydrase inhibitor. Unfortunately, visual acuity in the right eye was not changed after the treatment. In the cardiovascular evaluation, there was a fibro-fatty plaque in the right internal carotid artery at carotid Doppler ultrasonography. There were also calcified mitral and aortic valves in the echocardiography. Serum cholesterol level was 231 mg/dL and serum low-density lipoprotein level was 166 mg/dL. Prothrombin time and partial thromboplastin time were in the normal range. An urgent erythrocyte sedimentation rate, C-reactive protein, and complete blood count were normal. The patient’s blood pressure was measured at 170/100 mm Hg. One month after the admission, visual acuity did not change in either eye. There was no iris neovascularization in both the eyes. However, there was a neovascularization of optic disc in the right eye. Optical coherence tomography (OCT) revealed diffuse thickening of the inner retinal layers. Increased reflectivity was noted in the inner retinal layers from the surface of the retina to the photoreceptor layers. Colored fundus photographs and OCT images in the 1st month are shown in Fig. 3.

Discussion

Retinal arterial occlusions are divided into central and branch groups depending on the precise site of occlusion. Commonly, BRAO and CRAO occurs secondary to an emboli. Generally, emboli may originate from atheromatous plaques in the ascending aorta or carotid arteries, as well as calcified heart valves. Emboli to the retinal circulation may originate at any point in the proximal circulation from the heart to the ophthalmic artery.^[1] Emboli are visible 62% of the time on fundus examination in BRAO. Emboli were also visible in our patient in the left eye and it probably originated from the plaque in the calcified mitral and aortic valves. In CRAO, potential embolic sources are found in less than 40% of the

Access this article online	
Quick Response Code:	Website: www.ijjo.in
	DOI: 10.4103/0301-4738.119331

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Manuscript received: 06.08.12; **Revision accepted:** 30.07.13

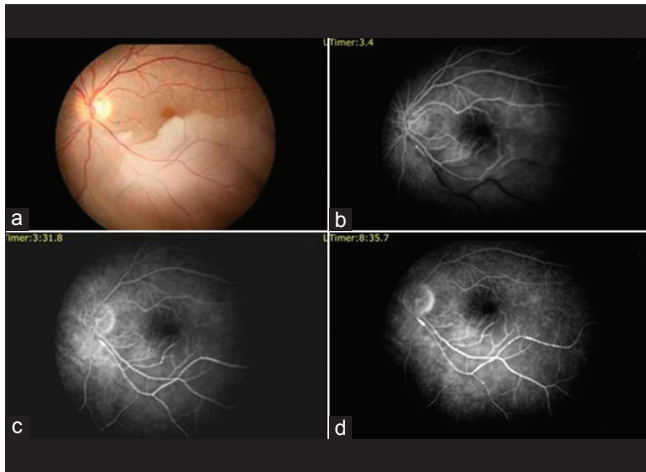


Figure 1: (a) The right eye fundus photo reveals whitening of the inferior retina with a calcified plaque at the disc margin within the inferotemporal artery. (b-d) The left eye fluorescein angiogram shows delay in arterial filling in the affected blood vessels and late leakage from the embolus site



Figure 2: (a) The right eye fundus photo shows a disc pallor, attenuation of retinal arteries, retinal edema, and a “cherry-red spot” appearance of the macula. (b) The right eye red-free photograph shows segmentation of the blood columns because of the multiple emboli plaques

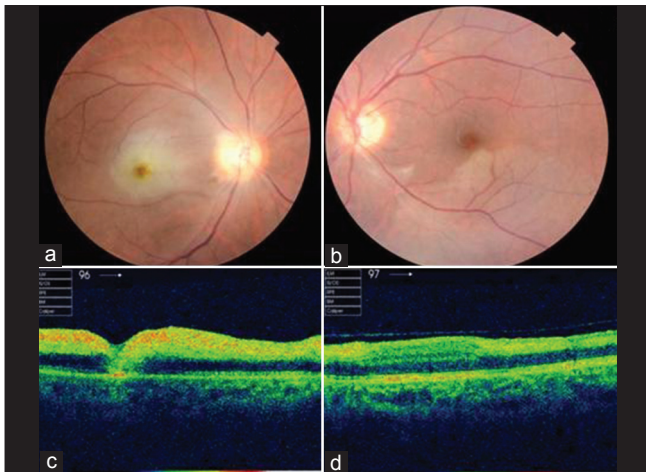


Figure 3: (a) Fundus photograph in the right eye in the first month. (b) Fundus photograph in the left eye in the first month. (c) OCT image of the right eye in the first month. (d) OCT image of the left eye in the first month

cases. However, most common etiologic association is the significant ipsilateral carotid artery disease which is present in approximately one-third of all the patients. In our patient, the emboli in the right eye probably originated from the atheromatous plaque in the ipsilateral internal carotid artery. The existence of emboli must be considered carefully during the retinal examination for the patients with temporary or permanent visual impairments. If emboli are present, this should be urgently evaluated for cardiovascular disorder by a cardiologist. Retinal artery occlusion is also associated with hyper-tension, diabetes, vascular spasm as in migraines, hyper-coagulable states, glaucoma, or trauma.^[2] In addition, hypertension was a significant risk factor in this patient.

Multiple studies have shown that increased morbidity and mortality in the patients with retinal arterial emboli.^[3] As there is a strong association with fatal systemic disease and risk of blindness, all patients who suffer from retinal artery occlusion

should undergo a detailed and rapid systemic evaluation. Because the accompanying visual loss tends to be severe and permanent, diagnosis and systemic treatment of these patients are critical. Eliminating the risk factors is important for well-being of the unaffected eye. Therefore, the patient was consulted with cardiology. Accordingly, Aspirin was prescribed 80 mg a day for reducing the risk of strokes, heart attacks, and the risk of blood clots in the body. In addition, 20 mg a day of rosuvastatin was added to her medications for the diagnosis of hypercholesterolemia. Rosuvastatin is a member of the drug class of statins, they used to treat high cholesterol and prevent cardiovascular disease. Also, diet, exercise, and weight reduction were recommended as a part of the treatment. They play a role indirectly for secondary prevention of further end organ ischemia.^[4] Furthermore, 80 mg of valsartan and 12.5 mg of hydrochlorothiazide fixed-dose combinations were prescribed once daily for the hypertension by the cardiology team.

There has been recent interest shown in the use of thrombolytic therapy, delivered either intravenously or intra-arterially by direct catheterization of the ophthalmic artery. Two large reviews have recommended that thrombolysis in the treatment of CRAO may recover the visual acuity with few serious complications.^[5,6] However, data from a large multicenter randomized studies have failed to point out an improvement in the visual acuity.^[7,8] This treatment must be performed within a short time period, probably within 6 h of symptom onset. Due to the lack of technical infrastructure in our hospital, we were not able to use this treatment.

As a conclusion, it is an unfortunate condition to have CRAO on the right eye while investigating the reasons and risk factors for BRAO on the left eye in this patient. Detailed and rapid systemic evaluation and cardiologic preventions were altered because of the risk of death and complete occlusion on her left eye. The patient was reviewed 2 years later which has proved the same including her vision and her systemic condition has been stable.

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Cite this article as: Caglar C, Caglar Z, Gul A. The central retinal artery occlusion in the right eye followed by a branch retinal artery occlusion in the left eye four days later. *Indian J Ophthalmol* 2013;61:667-9.

Source of Support: Nil. **Conflict of Interest:** None declared.