



# Sequential Presentation of Superior and Inferior Branch Retinal Artery Occlusion in the Same Eye

Berrak Sekeryapan Gediz, Mehmet Ali Sekeroglu

Department of Ophthalmology, University of Health Sciences Ulucanlar Eye Training and Research Hospital, Ankara, Turkey

## Abstract

Branch retinal artery occlusion (BRAO) accounts for approximately 40% of retinal artery obstructive disease. The visual prognosis is relatively good, with the exception of recurrent BRAO. Recurrent BRAO may be idiopathic or associated with conditions such as systemic vasculitides, blood dyscrasias, floppy mitral valve syndrome, or Susac syndrome. This report describes a patient who presented with an inferior BRAO without any indication of systemic disease. There was a history of a superior BRAO in the same eye. Patients with a BRAO are at significant risk for future cardiovascular and cerebrovascular events and these patients should be referred to a neurologist and a cardiologist immediately after diagnosis.

**Keywords:** Branch retinal artery occlusion, recurrent, Susac syndrome.

## Introduction

Branch retinal artery occlusion (BRAO) typically presents with sudden sectoral visual field loss. The most common cause is an embolism from the carotid artery. However, possible underlying systemic etiological factors should be considered in recurrent cases. The visual prognosis for a BRAO is variable, but relatively good (1-3). This report describes the case of a patient with no systemic disease but who presented with an inferior BRAO and had a history of a superior BRAO in the same eye.

## Case Report

A 59-year-old man without any known systemic findings presented with the complaint of acute vision loss in his left eye ongoing for 1 week. He also described an inferior visual field defect in the same eye present for 2 years. His corrected visual acuity at presentation was 20/25 in the right eye and

counting fingers in the left eye. The anterior segment findings and intraocular pressure were normal. Examination of the posterior segment revealed retinal whitening in the distribution of the inferior branch retinal artery in the left eye. (Fig. 1) Optical coherence tomography (OCT) revealed a thickened and hyperreflective inner retina corresponding to the whitened inferior retina. A vertical OCT scan indicated that the upper retina was atrophic (Fig. 2). Fluorescein angiography revealed delayed filling in the inferotemporal distribution as well as the superotemporal distribution (Fig. 3). The diagnosis of sequential superior and inferior BRAO was made based on these findings. The patient was referred to the neurology, cardiology, hematology, and rheumatology clinics. Although no underlying factor was found, antiplatelet treatment was administered. Six months after the initial presentation, an OCT scan showed total atrophy of the retina similar to a central retinal artery occlusion (CRAO) (Fig. 4).

**Address for correspondence:** Berrak Sekeryapan Gediz, MD. Saglik Bilimleri Universitesi Ulucanlar Goz Egitim ve Arastirma Hastanesi, Goz Hastaliklari Klinigi, Ankara, Turkey

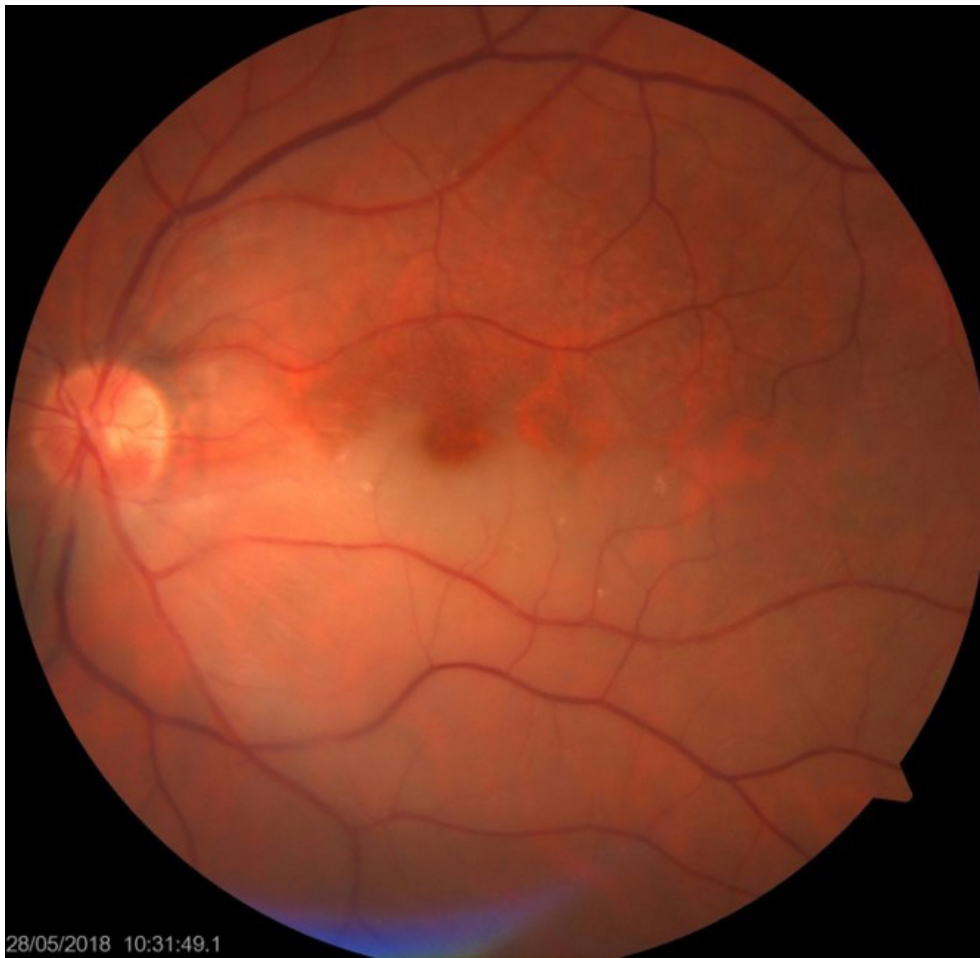
**Phone:** +90 533 369 41 83 **E-mail:** berrakgediz@gmail.com

**Submitted Date:** April 08, 2020 **Accepted Date:** June 25, 2020 **Available Online Date:** December 28, 2020

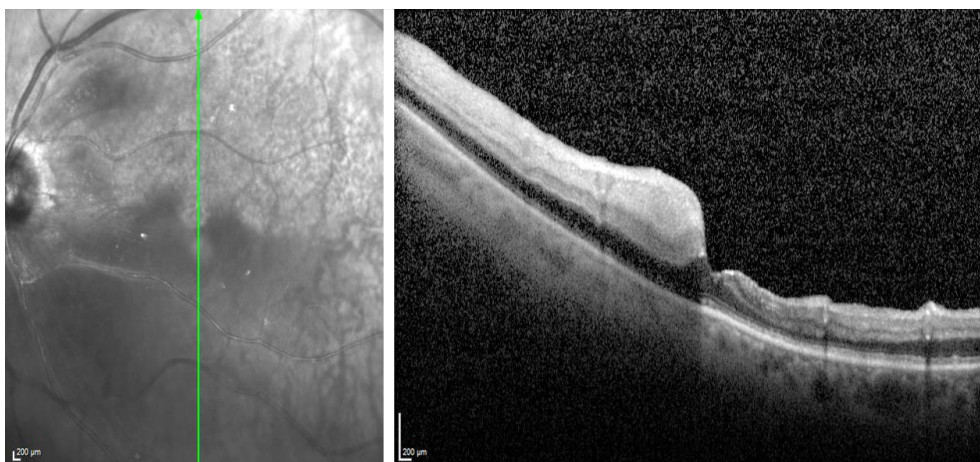
©Copyright 2020 by Beyoglu Eye Training and Research Hospital - Available online at [www.beyoglueye.com](http://www.beyoglueye.com)

OPEN ACCESS This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.





**Figure 1.** Fundus photography of the left eye showing retinal whitening in the inferior branch retinal artery distribution.



**Figure 2.** Optical coherence tomography showing a thickened and hyperreflective inner retina corresponding to the whitened inferior retina and an atrophic retina corresponding to the upper retina.

## Conclusion

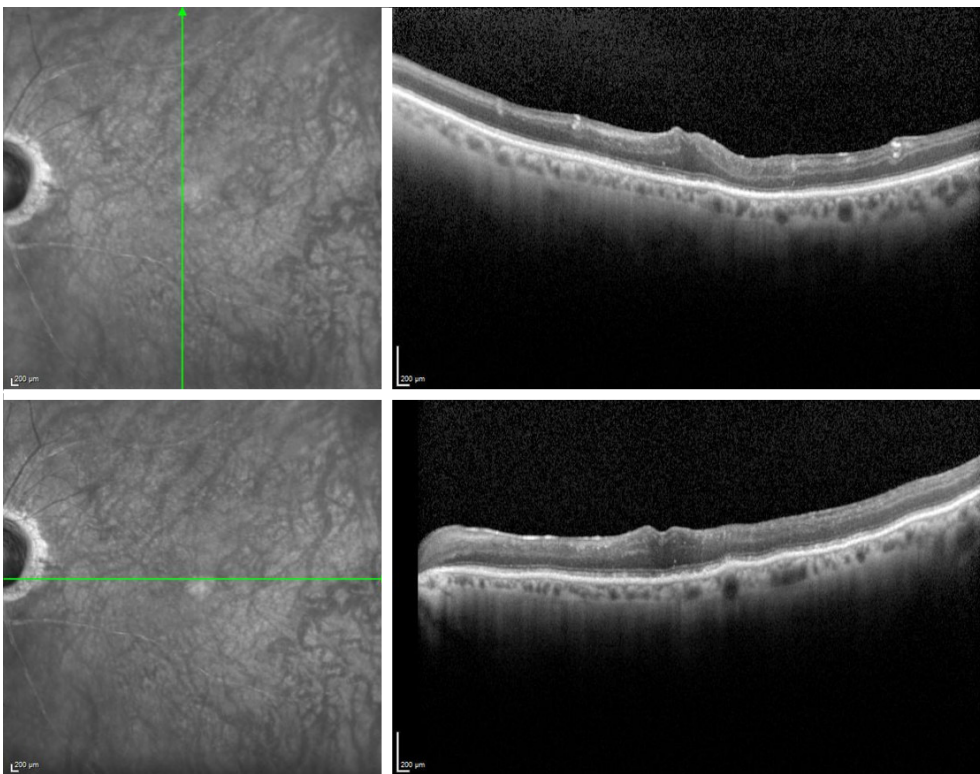
BRAO accounts for approximately 40% of retinal artery obstructive disease. BRAO presents with inner retinal whitening in the distribution of the obstructed vessel. It manifests

as acute segmental visual loss secondary to retinal ischemia. However, the visual prognosis is relatively good, and in most cases visual acuity is 20/40 or better (1-3).

CRAO and BRAO are most often embolic. The emboli



**Figure 3.** Fluorescein angiography showing delayed filling in the inferotemporal distribution and the superotemporal distribution.



**Figure 4.** Optical coherence tomography scan at 6 months illustrating total atrophy of the retina similar to a central retinal artery occlusion.

most frequently arise from a carotid or cardiac source. However, the underlying cause cannot be found in a significant portion of patients (1, 4). It has recently been proposed to consider a combination of CRAO and BRAO as acute retinal arterial ischemia, which is a stroke equivalent and represents an ophthalmologic and medical emergency (5). According to stroke guidelines, the development of acute retinal arterial ischemia is associated with a higher risk of a subsequent ischemic event (myocardial infarction or cerebral infarction) and the highest risk of a subsequent cerebral infarction occurs within the first week following acute retinal arterial ischemia (6, 7). Consequently, patients with an acute CRAO or BRAO must be evaluated similarly to patients with acute cerebral ischemia.

Recurrent BRAO may be idiopathic or associated with systemic vasculitides, connective tissue disorders, blood dyscrasias, floppy mitral valve syndrome, or Susac syndrome (8-10). Susac syndrome is an autoimmune endotheliopathy associated with microvascular occlusions in the brain, retina, and inner ear. The classic clinical triad of BRAO, encephalopathy, and hearing loss is present in only 13% of patients on initial presentation, though 85% of patients will develop the complete triad during the course of their disease. Since the characteristic signs often do not occur simultaneously or may be too subtle for the patient to notice, the diagnosis of Susac syndrome is often difficult. Magnetic resonance imaging (MRI) lesions in the gray and white matter are helpful in the diagnosis. Spoke-like lesions of the corpus callosum are

the classic MRI finding. Retinal arteriolar wall hyperfluorescence observed on fluorescein angiography and inner retinal atrophy on OCT are also helpful in the diagnosis. In addition, an audiological examination may show low-frequency hearing loss, vertigo, or tinnitus (10, 11).

In the present case, sequential occlusion of the superior and inferior artery in the same eye led to severe vision loss as a result of total atrophy of the inner retina. Although our patient had no known systemic disease, the underlying systemic factors should be investigated in sequential or recurrent BRAO cases. In addition, it should be kept in mind that patients with a BRAO are at significant risk for future cardiovascular and cerebrovascular events and these patients should be referred to a neurologist and a cardiologist immediately after diagnosis.

#### Disclosures

**Informed consent:** Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Authorship Contributions:** Involved in design and conduct of the study (BSG); preparation and review of the study (MAS); data collection (BSG).

#### References

- Hayreh SS, Podhajsky PA, Zimmerman MB. Retinal artery occlusion: associated systemic and ophthalmic abnormalities. *Ophthalmology* 2009;116:1928–36. [\[CrossRef\]](#)
- Hayreh SS. Acute retinal arterial occlusive disorders. *Prog Retin Eye Res* 2011;30:359–94. [\[CrossRef\]](#)
- Bürümcek EY. Retina arter tıkanıklıkları ve tedavisi. *Ret - Vit* 2004;12:225–32.
- Hong JH, Sohn SI, Kwak J, Yoo J, Ahn SJ, Woo SJ, et al. Retinal artery occlusion and associated recurrent vascular risk with underlying etiologies. *PLoS One* 2017;12:e0177663. [\[CrossRef\]](#)
- Bioussé V, Nahab F, Newman NJ. Management of acute retinal ischemia: Follow the Guidelines! *Ophthalmology* 2018;125:1597–607. [\[CrossRef\]](#)
- Johnston SC, Albers GW, Gorelick PB, Cumbler E, Klingman J, Ross MA, et al. National Stroke Association recommendations for systems of care for transient ischemic attack. *Ann Neurol* 2011;69:872–7. [\[CrossRef\]](#)
- Sacco RL, Kasner SE, Broderick JP, Caplan LR, Connors JJ, Culverbras A, et al; American Heart Association Stroke Council, Council on Cardiovascular Surgery and Anesthesia; Council on Cardiovascular Radiology and Intervention; Council on Cardiovascular and Stroke Nursing; Council on Epidemiology and Prevention; Council on Peripheral Vascular Disease; Council on Nutrition, Physical Activity and Metabolism. An updated definition of stroke for the 21st century: a statement for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2013;44:2064–89. [\[CrossRef\]](#)
- Johnson MW, Thomley ML, Huang SS, Gass JD. Idiopathic recurrent branch retinal arterial occlusion. Natural history and laboratory evaluation. *Ophthalmology* 1994;101:480–9. [\[CrossRef\]](#)
- Recchia FM, Brown GC. Systemic disorders associated with retinal vascular occlusion. *Curr Opin Ophthalmol* 2000;11:462–7.
- Ammar MJ, Kolomeyer AM, Bhatt N, Tamhankar MA, Mullen MT, Brucker AJ. Recurrent branch retinal artery occlusion from susac syndrome: case report and review of literature. *Retin Cases Brief Rep* 2020;14:315–20.
- Joe SG, Kim JG, Kwon SU, Lee CW, Lim HW, Yoon YH. Recurrent bilateral branch retinal artery occlusion with hearing loss and encephalopathy: the first case report of Susac syndrome in Korea. *J Korean Med Sci* 2011;26:1518–21. [\[CrossRef\]](#)