

# A Peculiar Retinal Scan in a Patient With Diabetes

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A 70-year-old man with a medical history significant for well-controlled type 2 diabetes, hypertension, hyperlipidemia, and obesity presented to our primary care clinic for a diabetic retinopathy screen with the clinic's new retinal scanner. Results of his last eye examination 2 years prior to presentation were within normal limits, and he reported no changes in vision since then. A recent test showed that his hemoglobin A1C level was 6.1%. While his right eye retinal scan was normal, the left retinal scan showed some abnormalities (Figure).

**What is your diagnosis based on this retinal scan?**

- A. Branch retinal vein occlusion
- B. Diabetic retinopathy
- C. Closed comedones
- D. Hypertensive retinopathy
- E. Branch retinal artery occlusion



**Correct answer: Branch retinal vein occlusion (BRVO)**

Retinal vein occlusion is the second-most common retinal vascular disorder causing vision loss after diabetic retinopathy. BRVO respects the horizontal meridian and is limited to the distribution of the involved vein. BRVO is thought to be caused by mechanical compression at an arteriovenous crossing that leads to hemorrhage along the distribution of the distal vein.<sup>1</sup> It is most commonly associated with hypertension. Retinal findings include retinal hemorrhage, edema, dilated retinal venules, and cotton wool spots. Our patient has superior temporal BRVO in his left eye. Risk factors include old age, hypertension, hyperlipidemia, smoking, hypercoagulable state, and

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glaucoma. Patients with BRVO may be asymptomatic or may present with painless peripheral vision loss or blurred vision if the macula is involved. Patients with retinal vein occlusion should be referred to ophthalmologist. Treatment is indicated for BRVO with macular edema or neovascularization, including intravitreal injection of vascular endothelial growth factor (VEGF) inhibitors, intraocular corticosteroids, and grid laser photocoagulation.<sup>2-4</sup>

### Differential diagnosis.

Diabetic retinopathy is the leading cause of impaired vision in people aged 25 to 74 years. In contrast to BRVO, which is limited to the vein involved, diabetic retinopathy is typically bilateral and impacts all quadrants of the retina. Retinal findings include retinal hemorrhages, yellow lipid exudates, dull-white cotton wool spots, neovascularization, vitreous hemorrhage, and retinal detachment. Prevention of diabetic retinopathy includes adequate control of hyperglycemia and blood pressure. Treatment of diabetic retinopathy includes intravitreal injection of VEGF inhibitors, photocoagulation, and vitrectomy.<sup>5</sup>

Hypertensive retinopathy is the most common ocular disease related to hypertension. Patients are often asymptomatic. Common retinal findings include retinal arteriolar narrowing, arteriolar wall thickening or opacification, arteriovenous nicking, arteriolar hemorrhage, hard exudate, cotton wool spots, and optic edema. Hypertensive retinopathy is a predictor of systemic morbidity and mortality because of target organ damage. Treatment of hypertensive retinopathy is primarily focused on systemic blood pressure control. Retinopathy may regress with adequate blood pressure control.<sup>6</sup>

Branch retinal artery occlusion (BRAO) is an uncommon form of stroke that can be caused by carotid artery atherosclerosis, cardiogenic emboli, vasculitis, or other vascular diseases. Patients usually describe sudden, painless, partial vision

loss. Retinal findings include sectoral pattern of retinal opacification, retinal whitening, and cherry red spots. The clinical approach and management of BRAO are similar to those for stroke. Most patients with BRAO recover to baseline vision.<sup>7</sup>

### REFERENCES

1. Muraoka Y, Tsujikawa A. Arteriovenous crossing associated with branch retinal vein occlusion. *Jpn J Ophthalmol*. 2019;63(5):353-364. <https://doi.org/10.1007/s10384-019-00676-5>
2. Lam FC, Chia SN, Lee RM. Macular grid laser photocoagulation for branch retinal vein occlusion. *Cochrane Database Syst Rev*. Published online May 11, 2015. <https://doi.org/10.1002/14651858.cd008732.pub2>
3. Shalchi Z, Mahroo O, Bunce C, Mitry D. Anti-vascular endothelial growth factor for macular oedema secondary to branch retinal vein occlusion. *Cochrane Database Syst Rev*. Published online July 7, 2020. <https://doi.org/10.1002/14651858.cd009510.pub3>
4. Scott IU, Ip MS, VanVeldhuisen PC, et al. A randomized trial comparing the efficacy and safety of intravitreal triamcinolone with standard care to treat vision loss associated with macular edema secondary to branch retinal vein occlusion: the Standard Care vs Corticosteroid for Retinal Vein Occlusion (SCORE) study report 6. *Arch Ophthalmol*. 2009;127(9):1115-1128. <https://doi.org/10.1001/archophthalmol.2009.233>
5. Sun JK, Jampol LM. The diabetic retinopathy clinical research network (DRCR.net) and its contributions to the treatment of diabetic retinopathy. *Ophthalmic Res*. 2019;62(4):225-230. <https://doi.org/10.1159/000502779>
6. Modi P, Arsiwalla T. Hypertensive retinopathy. In: *StatPearls*. StatPearls Publishing; July 10, 2021. <https://www.ncbi.nlm.nih.gov/books/NBK525980/>
7. Mason JO 3rd, Shah AA, Vail RS, Nixon PA, Ready EL, Kimble JA. Branch retinal artery occlusion: visual prognosis. *Am J Ophthalmol*. 2008;146(3):455-457. <https://doi.org/10.1016/j.ajo.2008.05.009>