

Periretinal Hemorrhage Due to Retinal Arterial Macroaneurysm

The Role of ICG Angiography in Solving a Diagnostic Dilemma

Siamak Moradian, MD; Masoud Soheilian, MD

Labbafinejad Medical Center, Shahid Beheshti University, MC, Tehran, Iran

A 65-year-old woman presented with sudden visual loss of 2 weeks' duration in her right eye. She had a 20-year long history of systemic hypertension, ischemic heart disease and coronary artery angioplasty. Best-corrected visual acuity was counting fingers at 1m in her right eye and 20/30 in the left with trace positive relative afferent pupillary defect in the right eye. The only remarkable slitlamp finding was mild bilateral nuclear cataracts, intraocular pressure was 12 mmHg in both eyes. Fundus examination revealed 1+ media haziness secondary to mild vitreous hemorrhage in the right eye, normal optic disc, and a dense premacular hemorrhage with a subretinal component superiorly (Figures 1, 2). Funduscopy in the left eye disclosed signs of dry type age-related macular degeneration (AMD) manifesting as moderate-sized hard drusen and mild pigmentary derangement. Retinal vascular tortuosity and arterial narrowing due to hypertensive retinopathy and arteriolar sclerosis were noted in both eyes.

Differential diagnoses of the condition included retinal vascular accidents such as branch retinal vein occlusion (BRVO), choroidal neovascularization (CNV) due to neovascular AMD, and retinal arterial macroaneurysm (RAM). Indocyanine green angiography (ICGA) with HRA2 (Heidelberg Retina Angiograph 2) demonstrated a macroaneurysm in the superior temporal arterial branch which had been obscured by preretinal hemorrhage on funduscopy. Other angiographic findings included blockage of retinal vessels due to layering subhyaloid hemorrhage and blockage of choroidal vessels due to subretinal hemorrhage superior to the former. The involved artery had focal

tortuosity in the form of a Z-shaped kink near the aneurysm (Figures 3-5).

DISCUSSION

Retinal arterial macroaneurysms are acquired fusiform or saccular dilatations of retinal arteries, closely linked etiologically with systemic hypertension and atherosclerosis.¹⁻⁴ Distinct differences have been described between RAMs leading to hemorrhagic complications and those resulting in lipid exudation.⁵ Saccular or "blowout" aneurysms are more prone to bleeding, possibly as a result of a thin, stretched aneurysmal sac. This type of aneurysm develops closer to the optic nerve head where perfusion pressures are higher. Systolic blood pressures above 200 mmHg are more common in patients with bleeding macroaneurysms. The hemorrhage often obscures the aneurysm resulting in a diagnostic dilemma, but the presence of localized preretinal and subretinal hemorrhages over a major retinal artery with focal tortuosity or a Z-shaped kink of the involved artery at the location of the aneurysm suggest the possibility of its presence. Retinal capillary hemangiomas, microaneurysms and choroidal neovascular membrane with preretinal hemorrhages are the most important differential diagnoses for this condition.¹

The blocking effect of hemorrhages precludes detection of underlying pathology on fluorescein angiography. Therefore, in the pre-ICGA era, the exact diagnosis of the cause of preretinal hemorrhages was difficult and in most situations remained uncertain until resolution of the hemorrhages. Since the spectrum of excitation and emission wavelengths of ICG

molecules fall in the infrared range, penetration through blood and pigment is possible making the detection of underlying lesions possible.

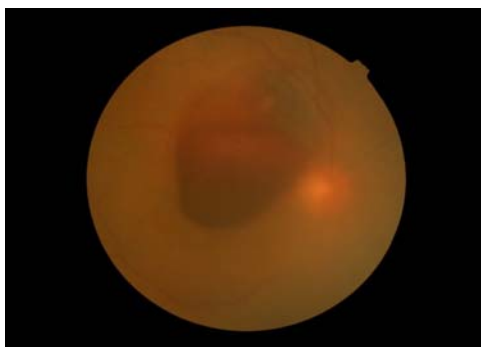


Figure 1 Color fundus photograph of the right eye: 1+ media haziness due to vitreous hemorrhage, preretinal and subretinal hemorrhage in the macula and superior temporal arterial arcade obscuring retinal vasculature.



Figure 2 Red free photograph of the right eye showing pre- and subretinal hemorrhage.



Figure 3 Early phase indocyanine green angiography of the same eye demonstrating a retinal arterial macroaneurysm (RAM) in the superotemporal arcade with Z-shaped kinking of the involved arteriole near the RAM, blockage of retinal vessels by the preretinal hemorrhage, and blockage of choroidal vessels by the subretinal hemorrhage superior to the former.

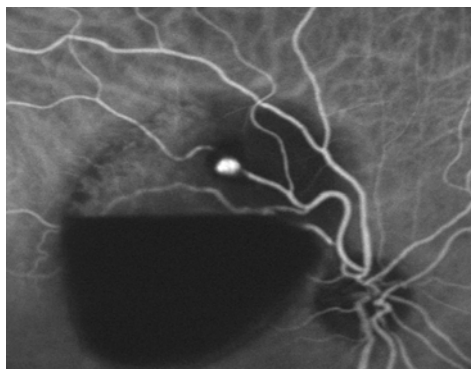


Figure 4 Mid-phase indocyanine green angiography of the same eye demonstrating the same findings.

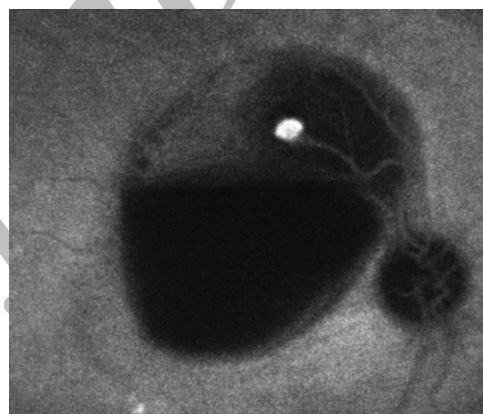


Figure 5 Late phase indocyanine green angiography: staining of the retinal arterial macroaneurysms.

Correspondence to: Siamak Moradian, MD. Assistant Professor of Ophthalmology; Ophthalmic Research Center, No. 5, Boostan 9 St., Amir Ebrahimi Ave, Pasdaran, Tehran 16666, Iran; Tel: +98 21 22585952, Fax: +98 21 22590607; e-mail: moradian33195@yahoo.com

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