



Retinal Vascular Diseases Hypertensive Retinopathy and Macroaneurysm

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Abstract

A detailed history of hypertension, including medication and compliance. Document headaches, difficulty breathing (dyspnea or orthopnea), chest pain, and cardiac, peripheral, and ischemic conditions [1]. Diabetes mellitus, cardiovascular diseases, sleep apnea, coagulopathies, and thrombotic disorders should be documented. Obtaining ocular history and history of previous ocular treatments are documented.

Keywords: Diabetes Mellitus; Hypertension; Dyspnea

Ocular examination

A list of ocular examinations should be set

- Best-corrected visual acuity (BCVA).
- Slit-lamp examination is recommended to rule out neovascularization on the iris. 6 Retinal Vascular Diseases
- Intraocular Pressure (IOP). When ischemic changes are confirmed, a gonioscopy can be scheduled.
- Bilateral dilated fundus exam to assess retinal findings includes:
 - Macular edema should be diagnosed clinically and by using OCT.
 - Signs of mild hypertensive retinopathy include vasoconstrictive changes and sclerotic changes such as silver, copper wiring, nicking, or nipping.
 - Signs of moderate hypertensive include exudative changes such as retinal hemorrhages, hard exudates, and cotton wool spots,
 - Signs of macroaneurysm appear as focal dilation at the level of the retinal artery, hemorrhage can occur in all retina and choroid layers in hemorrhagic macroaneurysm, while hard exudate and edema can be presented in exudative macroaneurysm.

- An Elschnig spot or Siegrist streak is characteristic of hypertensive choroidopathy, which can be caused by hypertension, pre-eclampsia, eclampsia, renal failure, and renal artery stenosis.
- Malignant hypertensive retinopathy presents as papilloedema in the optic disc.
- Neovascularization or vitreous hemorrhage is documented as well.

Diagnostic tests

Fundus images

To document hypertensive retinopathy signs and follow-up after treatment.

Optical coherence tomography (OCT)

Macular edema-related exudative hypertensive retinopathy and macroaneurysm are diagnosed using OCT. Treatment success is determined with OCT. Hypertensive choroidopathy causes pigmented epithelial detachments and choroidal thickness increases.

Fundus fluorescein angiography (FFA)

In malignant hypertensive retinopathy, FFA early phase is characterized by capillary nonperfusion and microaneurysm formation. Whereas in the late phase, the leakage is diffuse. As a result of hypertensive choroidopathy, retinal angiography shows patchy and delayed choroidal filling, as well as areas of retinal capillary nonperfusion. Initially hyperfluorescent, the macroaneurysm stains in late phases, and hypofluorescence is caused by blood blockage. An emergency plan should be in place at the FFA facility, explaining the rare complications of FFA [3].

B-scan

When the media is non-clear, a B-scan echography is important.

Systemic evaluation

In addition to an ECG, chest X-ray, fasting lipid profile, fasting glucose, and HbA1C along with serum creatinine and urinalysis are recommended to rule out systemic risk factors including stroke and cardiovascular disease.

Diagnosing patients with hypertensive retinopathy

Hypertensive retinopathy accompanied by prognostic information about coronary heart disease. Mortality [6] is associated with coronary artery calcification [4] and left ventricular hypertrophy [5].

Those with moderate hypertensive retinopathy are at risk of clinical or lacunar stroke [7], while those with retinal hemorrhage are at risk of hemorrhagic stroke [8].

Patients with hypertensive retinopathy are more likely to develop subclinical stroke and white matter atrophy [9]. Hypertensive retinopathy may cause microalbuminuria and renal impairment [10,11].

Long-term hypertension is characterized by arteriovenous nicking and generalized vasospasm, whereas short-term hypertension is characterized by retinal hemorrhages and microaneurysms [16].

People with generalized retinal arterial narrowing are more likely to develop hypertension and, among those with mild hypertension at baseline, to develop the severe stages.

Management of patients with hypertensive retinopathy and macroaneurysm

In most cases, hypertensive retinopathy requires systemic medical treatment to lower blood pressure below 140/90 mmHg under the supervision of a primary care physician.

Excluding other associated pathologies such as diabetes or cardiovascular disease is important. Acute hypertensive retinopathy may improve with systemic treatment, but chronic hypertensive retinopathy may not improve with it [12].

Malignant hypertensive retinopathy requires urgent antihypertensive treatment [17]. Pan-retinal laser photocoagulation is indicated for hypertensive retinopathy with proliferative changes. Spontaneous resolution may occur in cases with macroaneurysm.

Laser treatment with three rows of moderate-intensity burns adjacent to macroaneurysms has controversial results [13] due to the possibility of occluding an artery during treatment [14]. Studies showed that anti-VEGF injections for three consecutive months reduce macular edema, and hard exudates may improve retinal hemorrhage and macroaneurysm [15].

A pneumatic displacement with tPA is used in cases of persistent subretinal hemorrhage. YAG laser can induce hyaloidotomy for faster clearance of non-resolving preretinal hemorrhages covering the macula. In cases of large macroaneurysms and non-clearing vitreous hemorrhage, pars plana vitrectomy is recommended.

Follow-up and prognosis

A follow-up to the assessment of hypertensive retinopathy and compliance and resistance to systemic medications. The sclerotic changes are not reversible, which may cause retinal vein or artery occlusion.

Edema of the macular and optic disc caused by malignant hypertension may impair vision. Exudative macroaneurysms have a worse prognosis than hemorrhagic macroaneurysms [18], some cases of macroaneurysm may complicate into a macular hole which holds a bad prognosis as well [19].

Ethical Approval

The research was conducted ethically in accordance with the World Medical Association Declaration of Helsinki.

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Conflicts of Interest Disclosure

The authors declare that there are no conflicts of interest.

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