

Retinal circulation Arterial Macroaneurysms

Background

Retinal macroaneurysms are acquired, usually round, dilations of the large arterioles of the retina. Macroaneurysms are associated with systemic hypertension in approximately 75% of patients. They commonly are associated with macular exudation and hemorrhage, which may result in decreased visual acuity. A 10% incidence of bilateral disease exists, and multiple aneurysms in the same eye occasionally are seen.



Red-free photograph of left fundus of a 79-year-old woman presenting with decreased vision in left eye. This shows central macular exudation involving the fovea and intraretinal hemorrhages along the inferotemporal arcade. A whitish lesion is seen adjacent to the artery within the area of hemorrhage but is not well visualized. Visual acuity is 20/400.

Pathophysiology

Formation of retinal macroaneurysms is associated with systemic [hypertension](#) and [atherosclerotic disease](#), but serum lipid abnormalities also have been reported. About 10% of patients have focal arterial wall atheroma occurring at defects in the wall, which may be sites at risk of aneurysm formation. The aneurysms are sites of leakage of exudates and hemorrhage in the macula. Over time or after acute hemorrhage, spontaneous thrombosis and closure of the aneurysm may occur; in some cases, the artery may return to normal.

History

- Most patients present with sudden onset of painless vision loss in one eye.
- If the central macula is spared, the patient may be asymptomatic.
- Aneurysms that present without exudation or hemorrhages are asymptomatic.

Examination

- Aneurysmal dilation of the retinal arterioles occurs, usually at the site of vessel bifurcation or arteriovenous crossing in the major branch retinal arteries.
- The right eye more commonly is affected.
- The supertemporal artery most commonly is involved.
- Macroaneurysms also have been reported in cilioretinal arteries and on the optic nerve head.
- Occasionally, multiple aneurysms are present.
- Pulsatile flow occasionally is observed but does not necessarily indicate a higher risk of hemorrhage.
- Usually, leakage of protein-rich serum occurs, leading to circinate exudation and macular edema.
- Serous [retinal detachment](#) can occur.
- Bleeding is a common complication of aneurysm formation and can occur beneath the retina, the retinal pigment epithelium (RPE), the internal limiting membrane (ILM), or into the vitreous.

- Clinical complications of retinal macroaneurysms include vitreous haemorrhage, retinal detachment, macular holes, and [choroidal neovascular membrane formation](#).⁶

Causes

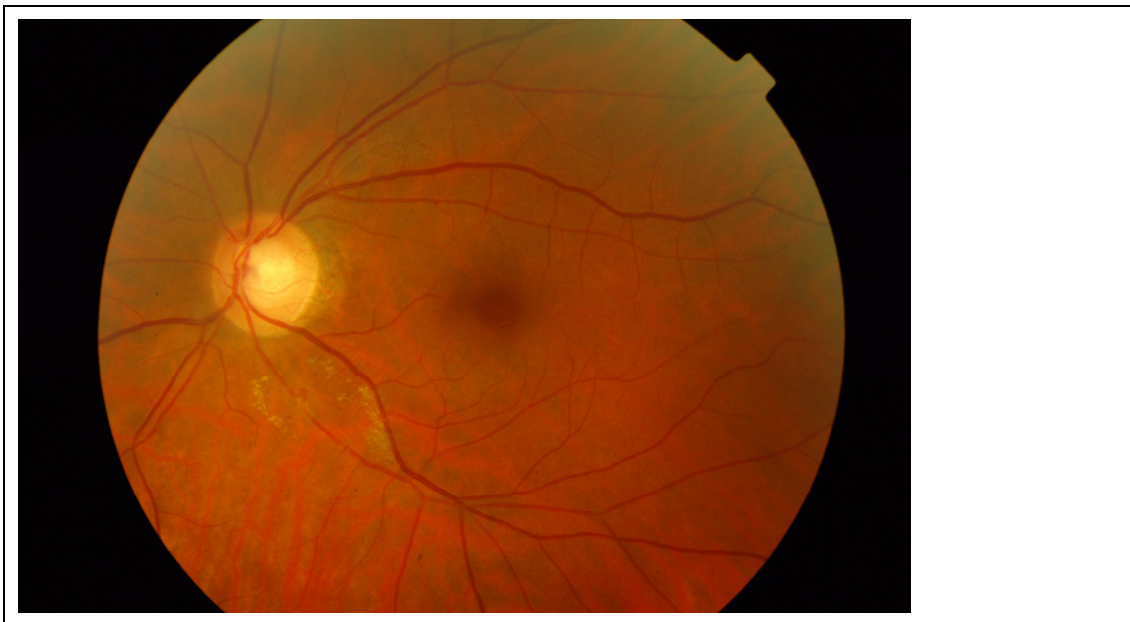
- The most commonly associated risk factor is hypertension ie high Blood pressure.
- Generalized arterial sclerosis is a common feature.
- In some patients, serum lipid abnormalities have been reported.
- In some patients, the Valsalva maneuver may be associated with an increased risk of hemorrhages

Laboratory Studies

- Blood pressure is likely to be elevated.
- Serum lipids may be elevated.
- Blood glucose is likely in the reference range. This test may be indicated to exclude undiagnosed diabetes in patients with exudative retinopathy in which the etiology is unclear.

Imaging Studies

- Fluorescein angiography is the most helpful imaging study for the diagnosis.
 - Saccular dilation of the arteriolar wall is diagnostic of the disease.
 - The angiogram is particularly important in making the diagnosis when hemorrhaging (which obscures the vasculature) occurs.
 - Late fluorescein leakage from within the areas of hemorrhage is characteristic of the aneurysms and may assist in the diagnosis when the vasculature is not visible on direct examination



Also Optical Coherence Tomography can show if there is any cystoid macular oedema present or even the aneurysm itself.

Medical Care

Control hypertension and serum lipids.

Surgical Care

- Laser photocoagulation
 - The treatment of retinal macroaneurysms by direct laser photocoagulation is standard and effective. Some risk of haemorrhage can occur but then the aneurysm will close. If the aneurysm is leaking fluid and bleeding then laser is advised.
 - The natural history of the disease suggests that many patients have significant visual recovery without treatment.
 - Treatment is generally recommended for persistent or progressive exudation in the macula.
 - Moderately heavy argon green or yellow dye laser is used with large spot size (500 μm) and long duration (0.5 s).
 - Direct treatment of the aneurysm is performed

Complications

- Vision loss from macular edema due to chronic exudation is well documented in many patients.
 - Laser treatment may be appropriate.
 - Additional complications include risk of retinal and subretinal hemorrhage, vitreous hemorrhage, and epiretinal membrane formation.
- Complications also can occur from laser photocoagulation

Prognosis

- The visual prognosis is excellent for many patients.
- The natural history of macroaneurysms suggests that most close spontaneously with restoration of near normal vision.
- Chronic macular exudation and haemorrhage can lead to vision loss, which is an indication to consider laser photocoagulation.
- A study suggests that patients with preretinal hemorrhages or vitreous hemorrhages due to retinal macroaneurysms have a good visual prognosis; however, patients with submacular hemorrhages have a poor visual prognosis.

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