



# Ophthalmopproblem

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A 57-year-old man visits your office for a physical examination. He has a 5-year history of choroidal rupture in his left eye due to injury from a golf ball. Direct ophthalmoscopic examination reveals several scars in his left eye, one involving the macula that looks as though some hemorrhaging was associated with it. Both retinas have tortuous arteries and veins, but have been stable since his first visit in 1998.

Ocular examination reveals visual acuities of 6/6 and 6/24 in his right and left eyes, respectively.

The appearance of the disk is compatible with the patient's having which of the following?

1. Angioid streaks
2. High myopia
3. Age-related macular degeneration
4. Choroidal rupture

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#### 4. Choroidal rupture

The eyeball is composed of 3 layers. From the outside working inward are the sclera, the choroid, and the retina. In the anterior eye, the sclera is continuous with the cornea. The choroid, the middle layer, is a pigmented, highly vascular structure that is involved in nourishing part of the retina. Toward the anterior part of the eye, the choroid is continuous with the ciliary body and the iris. In between the choroid and the retina lies a thin layer known as Bruch membrane. The portion of the retina adjacent to Bruch membrane is the retinal pigment epithelium.

Indirect or direct blunt trauma can cause a large force to be transmitted onto the eyeball, and this can lead to mechanical compression. The rebounding force on the eye causes an abrupt hyperextension of the choroid, leading to choroid rupture.<sup>1</sup> Any of the 3 layers of the eyeball can rupture, but commonly only the choroid ruptures. The sclera does not usually rupture because of its great tensile strength; the retina does not usually rupture because of its elasticity.<sup>1</sup> A large enough force, however, can rupture the globe.

A choroidal rupture occurs when there is a tear in the choroid, Bruch membrane, and the retinal pigment epithelium.<sup>2</sup> Indirect blunt trauma that occurs at the posterior pole away from the site of impact is the most common mechanism. Direct blunt trauma is a less common mechanism.<sup>1</sup>

Acute preretinal, retinal, or subretinal hemorrhaging follows a rupture.<sup>2</sup> The rupture itself is often obscured by the hemorrhage, but becomes clear as the hemorrhage is re-absorbed. At first, visual acuity is frequently reduced, but as the rupture heals, visual acuity can be expected to return to functional levels. The prognosis for ruptures involving the macula is unclear, although good results have been reported as long as there are no complicating factors, such as optic atrophy or a macular hole.<sup>3</sup> Fibrovascular proliferation seals the rupture, and a hyperplastic pigment epithelial scar forms.<sup>2</sup> Neovascularization occurs in the area of rupture, but should regress over the first few weeks. The healing process is complete in 3 weeks.

The most troublesome chronic complication is choroidal neovascularization (CNV), which can lead to hemorrhagic or serous macular detachment. This most frequently occurs during the first year after the injury but has been reported up to 5 years after injury.<sup>4</sup> Another complication of choroidal rupture is the formation of an epiretinal membrane. This membrane can be removed surgically.<sup>5</sup>

#### Management


Suspected choroidal ruptures should be managed at first in a hospital. In certain cases, fluorescein



angiography or indocyanine green angiography could be performed to look for retinal edema, hemorrhagic or serous detachment of the macula, or white curvilinear crescent-shaped streaks often concentric to the optic disk. Imaging might also be warranted to rule out orbital fractures and globe ruptures.<sup>6</sup>

During the first year after injury, patients should have regularly scheduled fluorescein examinations to detect CNV. Amsler chart testing is also helpful for detecting visual scotomas, which might signal CNV. Choroidal neovascularization, once detected, can be treated successfully with thermal laser photocoagulation as long as the new vessels are extrafoveal.<sup>7</sup>

#### Recommendations

Patients presenting with acute eye trauma should be investigated for globe rupture, hyphema, and foreign bodies. Patients presenting with chronic choroidal ruptures should have regularly scheduled ophthalmologic examinations to detect CNV early and to help preserve vision. 

#### References

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