

Retinal Diagnosis of AMD, Diabetes, and Other Ischemic Vascular Diseases

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Case-Based Questions (please see page 3 for answers)

1.	A 78-year-old male presents to the Emergency Department with sudden loss of vision in his right eye. Vital signs are temperature of 97.8 F, heart rate 80 per minute, 12 breaths per minute and blood pressure of 100/70 mm Hg. The Ophthalmologist is quickly consulted and confirms visual loss in the right eye with normal vision in the left eye. If you could examine the eye histopathologically which of the following findings are most likely to be present in central retinal artery occlusion?
a.	Marked retinal edema, focal retinal necrosis and intraretinal hemorrhage.
b.	Swelling of the nerve fiber and ganglion cell layers leading to inner ischemic retinal atrophy.
c.	Dilated intraretinal telangiectatic vessels, with microinfarcts of the nerve fiber layer
d.	Cytoid bodies and choroidopathy.
e.	Subdural hemorrhage in the optic nerve.
2.	You are reviewing the whole eye slides of an autopsy from a patient with a history of hypertension, hypercholesterolemia and diabetes mellitus. Which of the following findings are consistent with ocular histopathological features of ocular diabetes?
a.	Hard and soft drusen located under the retinal pigment epithelium.
b.	Diffuse thickening of the basement membrane of the ciliary body and lacy vacuolization of the iris.
c.	Ischemic atrophy of the inner retina with atrophy
d.	Extensive gliosis and retinal disorganization.
e.	Thickening of the basement membrane of the retinal pigment epithelium with microcalcifications.
3.	When reviewing eyes with history of age-related macular degeneration, which of the following features are most characteristic of the disease?
a.	Hemorrhages involving all the layers of the retina.
b.	Retinal microaneurysms and intraretinal microvascular abnormalities (IRMA).
c.	Formation of a cherry red spot in the retina.
d.	Hard and diffuse soft drusen located under the retinal pigment epithelium with subretinal neovascular blood vessels.
e.	Hyalinization of vessel walls

Scroll to page 3 for answers.

Answers

Question 1 Correct answer and rationale: B. Swelling of the nerve fiber and ganglion cell layers leading to inner ischemic retinal atrophy.

Central retinal artery occlusion (CRAO) is an ophthalmic emergency and requires referral to an emergency department for a stroke workup. On examination it commonly can demonstrate a “cherry red spot” in the central macula. This occurs as blocked retinal arteries induce ischemia to the inner retinal layers, particularly the nerve fiber layer, which causes edema and retinal whitening. The choroidal circulation is not blocked which allows for blood flow to the outer retinal layers and given the fovea lacks the nerve fiber layer, choroidal blood vessels create a drastic red contrast compared to the surrounding pale retina. Option A describes central retinal vein occlusion. Option C describes diabetic retinopathy changes. Option D is seen in diabetes. Option E is seen in abusive head trauma.

Question 2 Correct answer and rationale: B. Diffuse thickening of the basement membrane of the ciliary body and lacy vacuolization of the iris.

There are numerous changes in diabetic retinopathy. Vacuolization of the iris epithelium is due to intracellular glycogen deposits. In ocular diabetes, there is a diffuse thickening of the basement membrane of the ciliary epithelium along with thickening of the retinal vessels. Answer A is found in age-related macular degeneration. Answer C represents central retinal artery occlusion changes. Answer D describes long standing changes after a central retinal vein occlusion. Answer E is seen with normal aging changes.

Question 3 Correct answer and rationale: D. Hard and diffuse soft drusen located under the retinal pigment epithelium with subretinal neovascular blood vessels.

In age related macular degeneration there are discrete, hard and soft lesions under the retinal pigment epithelium in the macular or perimacular areas. Wet AMD develops subretinal neovascular blood vessels that are leaky and lead to the exudative consequences of the disease. Answer A is abusive head trauma. Answer B are features found in diabetic retinopathy. C is seen in central retinal artery occlusion and in lipid storage disorders. Answer E is found in eyes with systemic hypertension.