

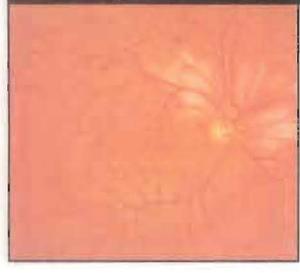
STUDY GUIDE

1. normal



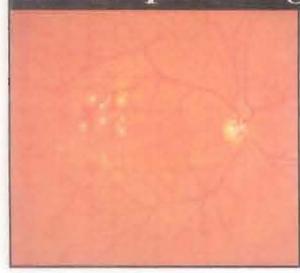
The color of the fundus is brown or orange. A slightly dark spot in the middle is the macula. At the portion 15 degrees nasally from the center on the horizontal axis, there is the papilla of the optic nerve which is circular or slightly elliptical shaped and has a slightly brighter tinge. The border between the papilla and the surrounding retina is clearly defined. The center of the papilla is indented and brighter than the periphery (excavatio papillae), and appears pale yellow. The area of the indentation is less than 60% of the total area of the papilla, and the retinal arteries and veins extend upward and downward nasally and aurally from the papilla's nasal side. On the nasal side, they run straight. The fine arteries and veins running from the papilla to the macula run straight. The arteries are bright red and the veins are darker, and in the center of the arteries appears a white linear reflection about 40 or 45% of the artery in width. The diameter of the artery is from 2/3 to 3/4 that of the vein.

2. hypertensive retinopathy



Arterial vasoconstriction grade 3, arteriosclerosis grade 1, hemorrhages, cotton wool spots, and simple vein concealment. The diameter of the constricted arteries is irregular and less than half that of the corresponding veins. Spotty hemorrhages are scattered. Soft exudates (cotton-wool patches) exhibit localized insufficient blood supply of the optical nerve tissue. Simple vein concealment appears at the crossings of artery and vein.

3. simple/background diabetic retinopathy



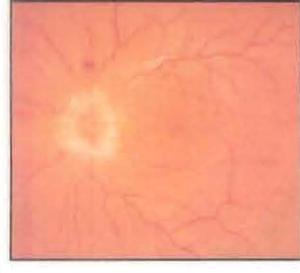
microaneurysms, hemorrhages and hard exudates. Spotty hemorrhages are scattered around. The extremely small red dots are microaneurysms, and the hard exudates are also apparent.

4. papilledema (chronic phase)



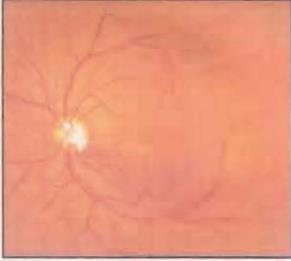
Caused by chronically increased intracranial pressure. The papilla of the optic nerve swells and protrudes into the vitreous body. The apical indentation of it (excavatio papillae) disappears, and the boundary between the papilla and surrounding retina becomes unclear. But in contrast to the acute phase, the amount of bleeding and exudation is smaller, and the degree of venous engorgement is less.

5. papilledema (acute phase)



Generally occurs as a result of increased intracranial pressure. The papilla swells and protrudes into the vitreous body. The apical indentation (excavatio papillae) disappears. The boundary between the papilla and the surrounding retina becomes unclear, and the retinal veins become engorged. Splinter hemorrhages appear in the retina.

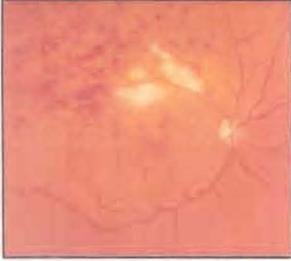
6. glaucomatous optic atrophy



glaucomatous optic disc cupping and nerve fiber bundle defect.

Glaucoma causes optic nerve atrophy. The indentation of the optic papilla (excavatio papillae) become pale and enlarges, and the diameter of it becomes over 60% of the total diameter of the papilla. (cup/disc ratio : $C/D > 0.6$) The color of the margin of papilla is normal, and the border between the papilla and the surrounding retina is distinct. When the papillary indentation stands out in this way, glaucoma should be suspected even without any other symptoms. Nerve fiber bundle defect appears in a radiating pattern from the papilla.

7. retinal vein occlusion (acute phase)



flame-shaped hemorrhages and cotton wool spots.

Caused by venous occlusion at the venous/arterial crossings where veins are pressed by sclerotic arteries. Flame shaped hemorrhages run along the surface of retinal veins, and soft white spots (cotton wool spots) appear. In areas without hemorrhages, crossing phenomena by arteriosclerosis can be observed.

8. retinal vein occlusion (after retinal laser photocoagulation)



The scar from retinal laser photocoagulation treatment can be seen as a series of whitish spots. After bleeding, the retinal veins form white lines.

9. toxoplasmosis



retinochoroiditis.

Caused by *Toxoplasma gondii*, the most of cases are inapparent infection. There are congenital cases and acquired cases, of which the present example is the latter. The lesion usually appears at posterior area of the retina, and causes localized exudative retinochoroiditis. In this case, white and gray lump can be seen at the macula.

10. age-related macular degeneration



macular exudates and subretinal hemorrhage.

The exudative and hemorrhagic changes of the macula which are seen mostly in patients over age 60. In the present case, the white area of exudates and the red area of hemorrhage are seen at the macula. Severe level of visual impairment occurs after repeated hemorrhage from newly formed blood vessels. The color of the fundus is brown or orange. A slightly dark spot in the middle is the macula. At the portion 15 degrees nasally from the center on the horizontal axis,