Results. Stereoscopic optic disc photographs of 9435 patients were screened for severely tilted optic discs. Thirty-two eyes (21 patients [0.22%]) with temporally tilted discs and 11 eyes (7 patients [0.07%]) with inferiorly tilted disc were enrolled. The control group consisted of 57 eyes (36 patients). Both the temporally and inferiorly tilted disc groups had a statistically significantly more myopic mean refractive error (mean [SEM], −7.67 [3.81] diopters [D] and −5.25 [3.86] D, respectively), higher astigmatism (mean [SEM], 1.07 [1.12] D and 1.68 [1.90] D, respectively), and worse visual field mean deviation (mean [SEM], −2.69 [2.21] dB and −4.01 [1.69] dB, respectively) and pattern standard deviation (mean [SEM], 2.66 [1.63] dB and 3.35 [2.71] dB, respectively) than the control group (P < .01). The average NFL thicknesses of the temporally (mean [SEM], 90.7 [16.4] µm) and inferiorly (mean [SEM], 92.4 [15.7] µm) tilted disc groups were statistically significantly lower than those of the control group (mean [SEM], 102.6 [9.6] µm) (P < .001 and P = .005, respectively).

The superior peak of the temporally tilted disc group was located more temporally than that of the control group (mean [SEM], 55° [19°] vs 75° [16°], respectively; P < .001). The inferior peak of the temporally tilted disc group was also located more temporally than that of the control group, but the difference was not quite statistically significant (mean [SEM], 297° [10°] vs 291° [21°], respectively; P = .08) (Figure 2).

The mean thicknesses of the temporal, superior, and nasal quadrants of the inferior tilted disc group were very similar (mean [SEM], 84.22 [18.96] µm, 85.36 [34.53] µm, and 84.50 [21.71] µm, respectively). With the mean NFL thickness of all 256 points along the circular scan plotted, no obvious peak of NFL thickness was noted in the superior half, but a peak was noted in the inferior half of the inferiorly tilted disc group (Figure 2).

The significance of all results remained unchanged on further analysis with repeated-measures linear regression models with a compound symmetry covariance structure to account for the inclusion of fellow eyes.

Comment. Eyes with tilted discs have a different distribution of NFL thicknesses compared with normal eyes, with the peak of the superior half of the temporally tilted disc shifted temporally and the superior peak of the inferiorly tilted disc blunted. These characteristics should be considered when applying OCT to the interpretation of NFL measurements in eyes with tilted discs.

Intraretinal Neovascularization in Diabetic Retinopathy

The hallmark of proliferative diabetic retinopathy is neovascularization occurring at the vitreoretinal interface and in the vitreous, even though intraretinal neovascularization (IRNV) is also reported to be a common finding if repeated fluorescein angiography is performed. However, the appearance of the IRNV in routine histological sections has been reported only rarely. Herein, we describe the histological features of IRNV in both eyes of a man with chronic diabetes mellitus.

Report of a Case. A 53-year-old man with chronic diabetes mellitus, hypertension, chronic kidney disease,
coronary artery disease, and congestive heart failure fell out of bed. The next morning he was unresponsive; a computed tomographic scan disclosed a large right subdural hematoma with 3 cm of a right-to-left midline shift of the brain and uncal herniation. He had fixed and dilated pupils, a Glasgow Coma Scale score of 3, and no spontaneous respirations or evidence of brain stem function. The patient was declared brain-dead and died shortly after having the ventilator removed. There was no recorded ophthalmologic history or eye examination.

Both eyes were enlarged, measuring 28 × 28 × 28 mm. On sectioning, both eyes had innumerable 0.1- to 1.0-mm-diameter retinal hemorrhages surrounding the macula. Microscopically, the neurosensory retina of both eyes had occasional thick-walled blood vessels and other vessels with occlusive fibrin microthrombi, some of which may have been an agonal event. Some arterioles with fibrin microthrombi had dual lumina typical of recanalization or intravascular endothelial proliferation. Other vessels exhibited vascular proliferation (Figure 1) with glomeruloid and angiomatoid appearances. Immunostains using antibodies to factor VIII–related antigen and CD34 confirmed the vascular identity (Figure 2). Widespread hemorrhages appeared throughout the neurosensory retina along with a few hemosiderin-laden macrophages around some retinal arterioles. Epiretinal membranes appeared in both eyes; the left retina had a few microinfarcts of the nerve fiber layer, cystoid macular edema, and serous exudates in the outer plexiform layer; and both eyes had low-lying serous detachments of the macular neurosensory retina as well as focal chorioretinal scars.

Comment. Takahashi et al noted IRNV in 54 of 94 eyes (57%) when repeated fluorescein angiography was used to examine patients with diabetes mellitus having non-perfused areas of retina. The IRNV occurred as capillaries that budded from a venule and grew to form a network. The IRNV developed in eyes with nonproliferative diabetic retinopathy or developed concomitantly with or after the appearance of new blood vessels at the vitreoretinal interface.

Despite the frequency with which IRNV is noted by fluorescein angiography, we found only 1 report of the microscopic features of this condition in human eyes in routine histological sections. Our histological findings were similar to those by Imesch et al, who examined the eyes from 5 individuals with diabetic retinopathy and noted intraretinal neovascular lesions consisting of multiple microvascular lumina spaced closely together and enveloped by a thick perivascular cuff containing collagen fibrils. The IRNV and preretinal neovascularization were sometimes contiguous.

Vascular endothelial growth factor has been implicated in the pathogenesis of proliferative diabetic retinopathy, and the histological appearance of the IRNV in these eyes is similar to that induced by intradermal injection of vascular endothelial growth factor in mice. The IRNV also resembles plexiform and angiomatoid lesions in lungs with pulmonary hypertension. Factors implicated in the pathogenesis of pulmonary plexiform lesions include overexpression of vascular endothelial growth factor, endothelin 1, and survivin; reduced expression of vascular antiremodeling mediators such as nitric oxide synthase and prostacyclin synthase; loss of expression of transforming growth factor β receptor 2 and proapoptotic Bax; and mutations in bone morphogenetic protein receptor 2, a component of the transforming growth factor β family. The similarity of IRNV with pulmonary plexiform lesions suggests potential avenues for investigating the pathogenesis of proliferative diabetic retinopathy.

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**Glomus Cell Tumor of the Orbit**

Glomus cell tumors are rare, benign neoplasms of the glomus body, a specialized thermoregulatory arteriovenous structure surrounded by smooth muscle–derived glomus cells and unmyelinated nerves located primarily in the dermis of the digits and palms. We describe the unique clinical, radiological, and pathological features of a large orbital glomus cell tumor necessitating exenteration for intractable pain.

**Report of a Case.** A 19-year-old woman developed protrusion and painful burning and throbbing of her right eye in February 2005. Initial biopsy revealed an orbital glomus cell tumor. Visual acuity was 20/30 OU. Pupillary, biomicroscopic, funduscopic, tonometric, and periorcular sensory examination results were normal with no identifiable bulbar cause for the pain. There was 3.5 mm of right proptosis (Figure 1A and B) with limited abduction and supraduction. Despite treatment with combinations of clonazepam, nortriptyline hydrochloride, gabapentin, and pregabalin and unchanged results on serial clinical examinations and magnetic resonance imaging, the patient requested tumor removal 24 months after the initial visit owing to nonparoxysmal, intractable pain that limited her daily activities.

A magnetic resonance image prior to exenteration demonstrated a large, irregular, lobulated right orbital mass measuring $2.6 \times 3.5 \times 3.3$ cm isointense to muscle on T1 weighting (Figure 1C) that diffusely enhanced with gadolinium (Figure 1D) and encased the right inferior and lateral rectus muscles anteriorly and all extraocular muscles posteriorly, causing medial deviation of the optic nerve (Figure 1C-E) and proptosis of the right eye (Figure 1C-E). No bone destruction was evident on computed tomography (Figure 1F).

Transconjunctival biopsy was performed to confirm the diagnosis before exenteration. Extensive bleeding was encountered and controlled during the biopsy. Despite good vision, the patient underwent right orbital exenteration using an orbitocranial approach for treatment of intractable pain and to prevent intracranial extension of the tumor given the malignant potential of the tumor, which fell into the category of glomus tumor of