Primary ocular lymphoma is the ocular manifestation of primary oculocerebral non-Hodgkin’s lymphoma. We describe a 79-year-old woman with a 7-year history of bilateral uveitis and subsequent central nervous system lymphomas. Repeated diagnostic vitrectomy during the following 5 years failed to demonstrate intraocular lymphoma cells. Within 9 months after the second vitrectomy, an epibulbar tumor developed in the limbal region of the left eye at the site of the sclerotomy. The eye, blind and painful due to secondary angle-closure glaucoma, was enucleated. Histopathologically, the globe showed a diffuse large B-cell non-Hodgkin’s lymphoma extending from the ciliary body outward through the sclerotomy. We conclude that, following vitrectomy, a primary ocular lymphoma may extend through the sclerotomy lesion and present as an epibulbar tumor. Uveal involvement may occur in oculocerebral non-Hodgkin’s lymphoma.

Ocular involvement in primary oculocerebral non-Hodgkin’s lymphoma often is difficult to diagnose. Vitrectomy is diagnostic in most but not all cases, and repeated vitrectomies may be necessary. We describe a 79-year-old woman with an unusual uveal involvement in primary oculocerebral non-Hodgkin’s lymphoma and an epibulbar tumor that developed at the site of the sclerotomy after a diagnostic vitrectomy for uveitis of unknown etiology.

Ocular involvement in primary oculocerebral non-Hodgkin’s lymphoma often is difficult to diagnose. Vitrectomy is diagnostic in most but not all cases, and repeated vitrectomies may be necessary. We describe a 79-year-old woman with an unusual uveal involvement in primary oculocerebral non-Hodgkin’s lymphoma and an epibulbar tumor that developed at the site of the sclerotomy after a diagnostic vitrectomy for uveitis of unknown etiology.

In 1986, symptoms of headache and nausea led to a diagnosis of cerebral lymphomas. Cranial computed tomographic scans and angiography revealed right temporocentral and left frontal tumors. Both tumors initially resolved after systemic corticosteroid treatment but partially reappeared after discontinuation of corticosteroid therapy. The tumors dissipated after cerebral radiation therapy (30 Gy). No central nervous system biopsy was performed. A medical workup, including computed tomography of the chest, ultrasonography of the abdomen, and hematological screening, revealed no evidence of systemic lymphoma. No central nervous system recurrence has been observed since.

In 1991, visual acuity had deteriorated and slitlamp examination revealed bilateral retrocorneal precipitates, subcapsular cortical cataracts, and vitreal opacities. In 1992, both eyes underwent extracapsular cataract extraction with silicone lens implantation, combined
with pars plana vitrectomy. Intraoperatively, small chorioretinal lesions were noted in the periphery of the left eye.

In 1997, the patient experienced rapidly progressive visual loss to light perception in the left eye. An iris nodule, a rubotic iris, an inferior exudative retinal detachment, and disseminated intraretinal hemorrhages were seen. After encircling the eye with a 2-mm silicone band, a second diagnostic pars plana vitrectomy was performed, including retinotomy, endolaser treatment, and silicone oil instillation (1000 centistokes) to ameliorate a necrotic-appearing retina temporally. Cytological examination of the vitreous revealed lymphocytes, without clear-cut evidence of lymphoma. Postoperatively, intraocular pressure increased to 40 mm Hg due to secondary angle closure glaucoma. Within 9 months after the second vitrectomy, a slowly enlarging, yellowish red subconjunctival mass developed at the limbal region between the 12 o’clock and 3 o’clock positions (Figure 1).

Microscopically, the ciliary body and the extracocular tumor consisted of medium- to large-sized centroblasts with scant cytoplasm, large lobulated nuclei, frequent multiple nucleoli, and numerous mitoses (Figure 4). Immunohistochemically, the cells were positive for LCA (CD45) and CD20, and some cells were positive for CD3. The proliferation fraction (MIB-1) of centroblasts was 80%. The histopathologic diagnosis was highly malignant B-cell non-Hodgkin’s lymphoma of the ciliary body with extracocular extension (diffuse large B-cell lymphoma). A small lymphocytic infiltrate adjacent to the tumor and in the uvea showed CD20 and CD3 cells but no centroblasts. The extraocular part of the tumor was surrounded by silicone oil–filled macrophages (CD68 [PGM-1] positive) and optically empty vacuoles. Silicone oil vacuoles were also found in the corneal endothelium, chamber angle, iris stroma, retina, choroid, and retrolaminar optic nerve. In the optic nerve, silicone oil vesicles were partly surrounded by a granulomatous inflammation and extended up the dissection end...
of the optic nerve to 2.5 mm behind the globe (Figure 5). The optic nerve showed signs of marked glaucomatous atrophy due to secondary angle-closure glaucoma with rubeotic iris. Retinal pigment epithelium defects were present in the equatorial region. An ulcerative necrotizing keratitis was present adjacent to the overlying tumor. The iris nodule, noted clinically, was due to a protrusion of the displaced haptic into the iris stroma, with perforation of iridal pigment epithelium and adjacent granulomatous inflammation.

**COMMENT**

In this case, we classified the diffuse large B-cell lymphoma of the ciliary body with extraocular extension as an ocular manifestation of a primary oculocerebral non-Hodgkin’s lymphoma. A thorough medical evaluation did not reveal any evidence of systemic lymphoma. The presentation as an epibulbar mass in our patient is unusual. Most likely, a ciliary body lymphoma was already present at the time of pars plana vitrectomy, grew through the sclerotomy site postoperatively, and enlarged subconjunctivally. The secondary angle-closure glaucoma with high intraocular pressure and intraocular silicone oil filling might have favored this growth mechanism. Another case of oculocerebral lymphoma and extraocular extension was reported by Raju and Green, in which an epibulbar mass developed by extension of a ciliary body lymphoma through the surgical wound following cataract extraction. Our case is, to our knowledge, the first report of extraocular extension of an oculocerebral lymphoma through the sclerotomy site following pars plana vitrectomy. In our patient, the lymphoma was mainly localized in the ciliary body. In the patient described by Raju and Green, the lymphoma included primarily the ciliary body, choroid, and iris. To our knowledge, these are the only 2 cases in which ocular involvement in oculocerebral lymphoma was confined to the uvea without the usual extension to the neurosensory retina and retinal pigment epithelium. Uveal lymphoma is normally associated with visceral or systemic lymphoma involvement. In silicone oil–filled eyes, silicone oil vacuoles can be displaced into the retrolaminar optic nerve. In our patient, these vacuoles extended up the dissection end of the optic nerve to 2.5 mm behind the globe. They were partly surrounded by a granulomatous inflammation. It remains to be studied how far backward to the optic chiasma silicone oil in the optic nerve can be displaced in eyes with raised intraocular pressure.

**Figure 4.** Light microscopy of the diffuse large B-cell non-Hodgkin’s lymphoma in the ciliary body with extraocular extension through the sclerotomy. A, Connection between the ciliary body lymphoma (cb) and the subconjunctival lymphoma (sc) at the site of sclerotomy 9 months after diagnostic vitrectomy (white arrowheads) (hematoxylin-eosin, original magnification ×25). Note also the disorganized retinal pigment epithelium adjacent to the ciliary body tumor (black arrows). B, Detail from A. Note the outward direction of tissue passing through the sclerotomy site (black arrowheads) from the ciliary body (cb) into the subconjunctival space (sc) (hematoxylin-eosin, original magnification ×140). C, The tumor consists of medium- to large-sized centroblasts with scanty cytoplasm, large lobulated nuclei, frequent multiple nucleoli (black arrows), and mitoses. Immunohistochemically, the cells were positive for LCA (CD45) and CD20; some cells were positive for CD3. The proliferation fraction (MIB-1) of centroblasts was 80%. D, Positive immunohistochemistry for silico-macrophages with a central optically empty vacuole containing silicone oil within the extraocular portion of the lymphoma (black arrows, CD68 [PGM-1]) (original magnification ×400).
The mean 5-year survival rate of patients with cerebral lymphoma with combined radiotherapy and chemotherapy is approximately 30%.4,7,11 Our patient is alive 14 years after the first signs of bilateral uveitis. Patient management of cerebral lymphoma with radiotherapy and corticosteroids, and surveillance of ocular lymphoma with vitrectomies and enucleation may have favored this unusually long survival.4,7,9

Accepted for publication June 20, 2000. We thank Dr H.-G. Gärtner for help in evaluating this patient; C. Rummelt for excellent technical assistance; and M.-L. Meckler for help with the literature search.

Reprints: Claus Cursiefen, MD, Department of Ophthalmology, Friedrich-Alexander-University Erlangen-Nürnberg, Schwabachanlage 6, 91054 Erlangen, Germany (e-mail: claus.cursiefen@augen.med.uni-erlangen.de).

REFERENCES


Figure 5. “Pseudocavernous” silicone oil optic neuropathy in the left eye with angle-closure glaucoma due to rubeotic iris and intracocular pressure levels above 40 mm Hg. A. Note multiple large optically empty vacuoles containing silicone oil (black arrows) in the retrolaminar optic nerve. Note also the optic nerve atrophy and central retinal vessels entering the globe (black arrowhead) (acid mucopolysaccharides, original magnification ×400). In contrast to Schnabel cavernous optic neuropathy, no acid mucopolysaccharides are detectable within the optically empty vesicles in the retrolaminar optic nerve. B. Silicone oil vacuoles (black arrowhead), CD68- (PGM-1)-positive silicone oil–containing macrophages (black arrows), and granulomatous inflammatory reaction adjacent to silicone oil in the retrolaminar optic nerve (white arrowheads) (hematoxylin-eosin, original magnification ×400). Silicone oil vesicles were present up the dissection end of the optic nerve to 2.5 mm behind the globe.