Congenital Ectropion Uveae and Glaucoma

Congenital ectropion uveae (CEU) is a rare, nonprogressive condition scarcely mentioned in the ophthalmic literature. According to its etiology, ectropion is classified into 2 groups: acquired and congenital. It is believed that the cause of acquired ectropion is membranous traction of the iris from secondary causes such as inflammation and ischemia.1

According to Dowling et al,2 the term congenital ectropion was introduced in 1869 by Colsman;3 however, it was later revealed that what was really described were flocculi. The first authors to actually describe congenital ectropion were Wicherkiewicz4 in 1891 and Spiro5 in 1896.

Congenital ectropion uveae consists of iris pigment epithelium on the anterior surface of the iris, anterior insertion of the iris, dysgenesis of the drainage angle, and glaucoma. Although the actual anomaly is nonprogressive, multiple studies6-10 have linked it with the appearance of progressive open-angle glaucoma due to angle dysgenesis.

Most descriptions of CEU2,6-10 have shown a relationship between the presence of ectropion and the eventual development of glaucoma. Some studies6-10 have also associated ectropion uveae with congenital defects and genetic diseases, but researchers have not yet verified whether the disease is genetically predetermined or whether it is clearly associated with any of these genetic defects.

In this article, a case of CEU in a 3-year-old girl is reported. Histopathologic examination of an iris tissue specimen obtained during surgical management of glaucoma demonstrated iris neovascularization. Thorough clinical examination revealed no neoplasia. Implications of neovascularization in the pathogenesis of CEU are discussed.

Report of a Case. In April 2001, a 3-year-old girl was referred to the William and Anna Goldberg Glaucoma Service, Wills Eye Hospital, Philadelphia, Pa, by a pediatric ophthalmologist for further management of treatment-resistant glaucoma. The patient had elevated pressure in the left eye, complaints of light sensitivity, ocular pain, occasional redness, and a “swollen eye.” Ocular history included iris ectropion (ectropion uveae) in the left eye and the development of a spontaneous hyphema. One week prior to referral, the intraocular pressure (IOP) was 35 mm Hg OS, and IOP-lowering medical treatment was instituted.

Visual acuity without refractive correction was “fix and follow” in both eyes. External, slitlamp, and gonioscopic examinations revealed no evident conjunctival, scleral, or corneal findings.

The left pupil was fixed and dilated, and ectropion uveae was evident (Figure 1). Red light reflex was present in both eyes and an enlarged eyecup was noted, although retinal hemorrhages were not present. It was concluded that the patient had open-angle glaucoma. Atropine therapy was discontinued, and an examination under anesthesia accompanied by a possible filtration procedure in the left eye was scheduled.

During the procedure, the IOP was 15 mm Hg OD and 39 mm Hg OS, with no intraocular inflammation. The left pupil was fixed and dilated, and the horizontal corneal diameter measured 13.0 mm OS and 11.5 mm OD. An abnormal angle with an anterior insertion of the iris was noted during gonioscopic examination (Figure 2). Aside from increased optic nerve cupping (0.6 cup-disc ratio), the posterior segment examination results were normal. Surgical trabeculectomy with adjunctive mitomycin C (0.4 mg/mL) for 2 minutes was performed, and a small piece of the iris measuring 2 × 1 mm was sent for histopathologic examination.

Microscopic examination disclosed a folded segment of the iris. A thin layer of iris pigment epithelium, seen both on high (Figure 3) and low magnification, extended...
onto the anterior surface of the iris, which was consistent with ectropion iridis (uveae). Bordering the area of ectropion iridis, the anterior iridic surface appeared flattened. The flattened area was very regular, suggesting that this reflected the presence of a delicate, fibrovascular surface membrane rather than a compression artifact. In some areas, blood was confined deep to the surface membrane, and there was also presence of iris neovascularization as well as intrastromal hemorrhage. There was no evidence of malignancy, ectopic Descemet membrane, or iris nodules (Figure 3).

Three months later, the IOP measured 11 mm Hg OD and 16 mm Hg OS, with a low-lying and diffuse bleb in the left eye. The horizontal corneal diameter was 12.25 mm OS and 11.25 mm OD with no Haab striae. The cup-disc ratio had improved to 0.2 OS (from 0.6), with a refraction of plano in the right eye and −5.0 diopters OS. All of the medications were discontinued, and the only therapeutic regimen thereafter was patching in the left eye for 4 h/d.

**Comment.** In 1985, Dowling et al described 10 patients with CEU, hypoplasia of the iris stroma, iridotrabecular dysgenesis, anterior insertion of the iris root, and glaucoma. No underlying systemic abnormalities were found. It was hypothesized that this syndrome originated from a neural crest cell migration abnormality. Almost all of the patients required surgical intervention for IOP control.

Ritch et al reported 8 cases of CEU. In this series, underlying systemic congenital pathological abnormalities were present in 7 of 8 patients. Neurofibromatosis, Prader-Willi syndrome, Rieger anomaly, and facial hemihypertrophy were found to occur concomitantly with CEU, suggesting the possibility of a neural crest cell disorder. Seven of 8 patients developed glaucoma.

The present case is unique in that the histopathologic specimen from the iridectomy indicated the presence of a distinct fibrovascular surface membrane covering the anterior aspect of the iris stroma. It is possible that this membrane was responsible for pulling the posterior pigmented layer of the iris anteriorly, creating the ectropion. This raises the question of whether this membrane together with the previously noted angle abnormality or the membrane itself is responsible for the decreased aqueous outflow and secondary glaucoma.

Also of interest was the presence of intrastromal hemorrhage, which is not believed to have resulted from intraoperative trauma, as well as the suggestion of neovascularization on the histopathologic specimen. In such cases, a neoplasm must always be excluded, and no neoplasm was found in this patient. This finding correlates with the patient’s history of a spontaneous hyphema, which may be similar to the finding of iris neovascularization in a case of CEU that was described by Roth and Shaffer. It also raises the question of the cause of the neovascularization as well as its relationship to angle malformation and neural crest cells. It may be possible that the primary insult is a vascular factor that secondarily leads to a defect in neural crest migration, similar to what was seen in an embryonal
However, these tumors can occasionally result in severe vision loss. One such case is described herein with the unusual associated symptom of sound-induced phosphenes.

**Report of a Case.** A 54-year-old white man sought care because of 5 months of blurred vision and decreased peripheral vision in the left eye. He was found to have a pigmented lesion on the left optic nerve and referred for further evaluation. He had no history of eye disease and his medical history was noncontributory.

On examination, his visual acuity was 20/20 OD and 20/32 OS. The pupils were symmetrical with no afferent pupillary defect. Intraocular pressures were 20 mm Hg OD and 21 mm Hg OS. There was no ocular melanocytosis. The right fundus appeared normal. A 2.5 × 2-mm darkly pigmented lesion obscured most of the left optic disc (Figure 1A). The lesion height was determined to be 1.2 mm by ultrasonography (Figure 2A). Fluorescein angiography demonstrated hypofluorescence in the area of the lesion, with late staining of the visible portion of the optic nerve head (Figure 3). Automated perimetry showed an inferior field defect in the left eye. The presumptive diagnosis was melanocytoma of the optic disc and observation was recommended.

Approximately 9 months after the initial examination, the patient noted a further decrease in vision in his left eye, pain behind the eye, and flashes of light on hearing a loud noise (sound-induced phosphene). Ultrasonography showed that the lesion's height had increased to 1.6 mm (Figure 2B). The lesion height was determined to be 1.2 mm by ultrasonography (Figure 3). Fluorescein angiography demonstrated hypofluorescence in the area of the lesion, with late staining of the visible portion of the optic nerve head (Figure 3). Automated perimetry showed an inferior field defect in the left eye. The presumptive diagnosis was melanocytoma of the optic disc and observation was recommended.

Eighteen months after the initial examination, the patient returned with further decrease in vision of the left eye to light perception. Fundus examination showed no change in the appearance of the melanocytoma (Figure 1C). Some peripheral retinal hemorrhages were noted. The height of the tumor remained at 1.6 mm when measured by ultrasonography. Seven months later, the patient had lost light perception in his left eye, and diffuse retinal hemorrhages were evident throughout the fundus with dilated and tortuous veins, consistent with a central retinal vein occlusion (Figure 1D). The height of the mass remained stable as determined by results of ultrasonography. Over the next 5 months, the patient developed neovascular glaucoma and, despite panretinal photocoagulation, the eye was enucleated because of pain. The sound-induced phosphenes persisted for up to 16 months after enucleation but decreased in frequency.

Gross pathologic examination of the enucleated eye revealed a 25 × 25 × 25-mm globe with 2 mm of optic nerve attached. Light microscopic examination showed partial closure of the anterior segment angle with peripheral anterior synechiae. A neovascular membrane was noted on the anterior surface of the iris with associated ectropion uveae. There were numerous hemorrhages throughout all retinal layers. Pigmented macrophages were noted in the subretinal space with some migration into the neural retina. The ganglion cell layer was attenuated. A heavily pigmented tumor occupied most of the anterior optic nerve (Figure 5A and B). Bleached sections showed small nuclei without prominent nucleoli (Figure 5C). No mitoses were seen. A large area of the retrolaminar portion of the tumor appeared to be necrotic. Proteinaceous debris was observed within a larger caliber venule, indicative of stasis (Figure 5D and F). A thrombus was noted in a vessel likely to be the central retinal artery with evidence of recanalization (Figure 5E). The optic nerve adjacent to the tumor was severely atrophic.

**Comment.** Melanocytoma of the optic disc is now commonly recog-