Iridocorneal Endothelial Syndrome

This disease is often misdiagnosed as an iris tumor.

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CASE PRESENTATION

A 76-year-old white man was referred to our clinic for evaluation of a pigmented lesion that recently increased in size. He had first noticed the abnormal iris pigmentation of his right eye 20 years ago and had been under observation for the previous 5 years. The patient denied any ocular or systemic symptoms; his past medical history was significant for cataracts in both eyes and hypertension.

On examination, the patient’s visual acuity was 20/70 in the right eye and 20/60 in the left. The IOP was 20 mm Hg in both eyes. The eyelids and conjunctiva were normal bilaterally. Anterior segment examination of his left eye revealed map-dot-fingerprint dystrophy of the left corneal epithelium. The right eye was remarkable for corectopia and oval elongation of the pupil (Figure 1). There was evidence of pigmentary migration from the posterior margin of the iris, across the anterior surface, and into the nasal limbal cornea. The cornea appeared to be decompensated near the 3-o’clock limbus, corresponding to an area of calcium deposits. Peripheral anterior synechiae extended from the 2- to the 5-o’clock position, with evidence of iridoschisis inferior nasally. A gonioscopic evaluation confirmed the presence of broad-based anterior synechiae (Figure 2). Vascularization of the iris or angle was absent. There was no evidence of an iris or ciliary body mass, either on clinical examination or by ultrasound biomicroscopy (Figure 3). The dilated fundus examination was normal in both eyes.

The clinical findings were diagnostic of iridocorneal endothelial (ICE) syndrome.

DISCUSSION

The term ICE syndrome was first used by Yanoff in 1979 to describe a group of disorders with similar iris, corneal, and angle abnormalities. It affects women predominantly and is usually diagnosed between the ages of 30 and 50 years. The underlying mechanism is the migration of corneal endothelial cells across the trabecular meshwork into the iris, causing contraction and distortion of the pupil and iris. The stimulus for this phenomenon is unknown. Some have speculated that ICE syndrome is secondary to a viral infection such as herpes simplex virus or Epstein Barr virus. Others believe it to be a result of neural crest cell abnormality or embryonic ectopia.

Patients with ICE syndrome are asymptomatic in the early stages and present with significant visual loss in later stages secondary to corneal dysfunction or glaucoma. The syndrome has three variants, namely iris nevus (Cogan-Reese) syndrome, Chandler syndrome, and essential iris atrophy. Although the presentations of the three
variants overlap, Cogan-Reese is characterized by the presence of pigmented nodules on the iris along with variable changes of the iris and cornea, which are also seen in the other two variants. Patients with Chandler syndrome generally have fewer marked iris changes but more corneal edema than essential iris atrophy. Essential iris atrophy, first described in the early 1900s, is a progressive deformity of the iris and pupil associated with corneal edema and glaucoma. The distinction between the three variants of ICE syndrome is not crucial, but differentiating this syndrome from an iris melanoma is essential.

The diagnosis of ICE syndrome is clinical and may be confirmed by specular microscopy in which "ICE cells" can be identified. These consist of unusually large and pleomorphic endothelial cells with prominent hyperreflective nuclei. The endothelial cell’s body is normally light, and the cell junction is dark; ICE cells, however, have dark-light reversal in which the cell body is darker than the cell junction, a feature of epithelial cells. On histopathology, these ICE cells have shown an epithelial phenotype because of their coexpression of cytokeratin and vimentin and possession of microvilli and desmosomes. Our patient’s specular microscopy showed slightly pleomorphic endothelial cells but did not have the hyperreflective nuclei or dark-light reversal described in some reports (Figure 4).

CONCLUSION
ICE syndrome is a progressive and incurable disease. However, many treatment regimens exist for the sequelae, namely unilateral glaucoma, which occurs in approximately 50% of patients with ICE syndrome and corneal edema. Glaucoma is often treated with topical drops to lower the IOP by decreasing the production of aqueous humor. Glaucoma filtering surgeries such as trabeculectomy or shunts are often needed. When corneal edema becomes clinically significant, patients may be eligible for a corneal transplant.

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