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Case Report

Use of Home Tonometry for Clinical Management of Unilateral Glaucoma Secondary to ICE Syndrome

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Abstract

A 63-year-old female with a history of prior cystoid macular edema (CME) and oral steroid use had been undergoing management of glaucoma secondary to iridocorneal endothelial (ICE) syndrome of the right eye. The patient had been diagnosed in 2011 following the incidental finding of iris cysts during an evaluation for LASIK. During her initial evaluation by a glaucoma specialist in 2013, an irregular pupil with corectopia along with scattered peripheral anterior synechiae (PAS) and 2+ to 3+ pigment of the trabecular meshwork (TM) were noted on exam (Figure 1). She had a best corrected visual acuity of 20/30 on the right and 20/20 on the left.

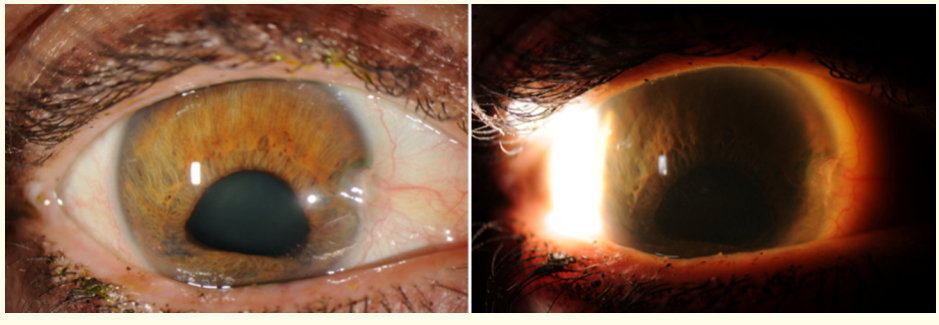

Figure 1: Photographs taken of patient's pupil shape anomalies corresponding to ICE syndrome during her initial glaucoma evaluation.

Keywords: Trabecular Meshwork (TM); ICE Syndrome

A Humphrey 24-2 SITA Fast visual field test showed global reduction and a mean deviation (MD) of –5 dB in the right eye due to cataract development with a full field in the left eye. Intraocular pressure (IOP) by applanation was 14mmHg in both eyes.

The patient was initially treated with IOP-lowering medications in the right eye. Over time, despite maximum medical therapy, her IOP rose into the 30s. In May 2018, she underwent a micropulse transscleral cyclophotocoagulation, but her IOP peaked at 45 mmHg one month later. In July 2018, a PreserFlo™ microshunt was placed and IOPs decreased to around 10 mmHg.

In 2020, our patient began using an iCare HOME2 (iCare, Finland) tonometer and reported slowly creeping IOPs into the 20s, alerting her physician to the encapsulation of the PreserFlo. Progression was noted on her visual field post-cataract surgery (MD worsened from –2.52 dB to –3.51 dB) and superior thinning on her OCT RNFL. In October 2022, the patient underwent a pars plana Ahmed ClearPath® 250 mm2 tube shunt combined with vitrectomy/membrane peel for her chronic CME. The pars plana approach was chosen because of the potential risk of corneal decompensation and to avoid interaction with the ICE cell membrane. Following removal of the ripcord suture two months later, the patient

reported iCare HOME IOPs of 4-10 mmHg off of all IOP-lowering medications (Figure 2). To manage the ongoing CME, topical steroids, non-steroid anti-inflammatory drug (NSAID) drops, and aflibercept injections have been utilized. As the patient had been a steroid responder in the past, ability to check her IOP remotely alleviated concern for potential IOP elevation while on steroids. To date, her IOP continues to be well-controlled and remotely monitored by our team.

ICE Syndrome is a rare disorder of proliferating atypical corneal endothelial cells that often presents unilaterally in middle-aged women [1]. These "ICE cells" develop epithelial-like characteristics and migrate posteriorly, crowding the TM and leading to iris changes and secondary glaucoma. ICE syndrome is thought to be related to underlying viral infection, particularly HSV [2]. ICE Syndrome includes three subvariants: Chandler, Essential Iris atrophy, and Iris Nevus/Cogan-Reese. Cogan-Reese syndrome is characterized by the presence of multiple iris nodules in the later disease stages and peripheral anterior synechiae, leading to an increase in intraocular pressure (IOP).

This case illustrates the complex medical and surgical management of an ICE Syndrome patient, illuminated by home tonometry. Previous case reports highlight the severity of glaucoma in ICE Syndrome, that are often poorly controlled by medical management alone [3]. Glaucoma drainage devices are shown to be an effective alternative to trabeculectomy in these patients, where membrane proliferation and PAS can obstruct the filtration site ostium [4]. This finding was confirmed by our patient's diminished IOP fluctuation following placement of a pars plana glaucoma drainage device, as evidenced by her home tonometry readings (Figure 2). In summary, serial home tonometry demonstrated to the clinical team that (1) the patient's PreserFlo bleb had encapsulated in 2020, (2) the postop IOP was appropriately controlled in 2022, and (3) the tube shunt was fully open, underscoring the utility of home tonometry in management of secondary glaucoma.

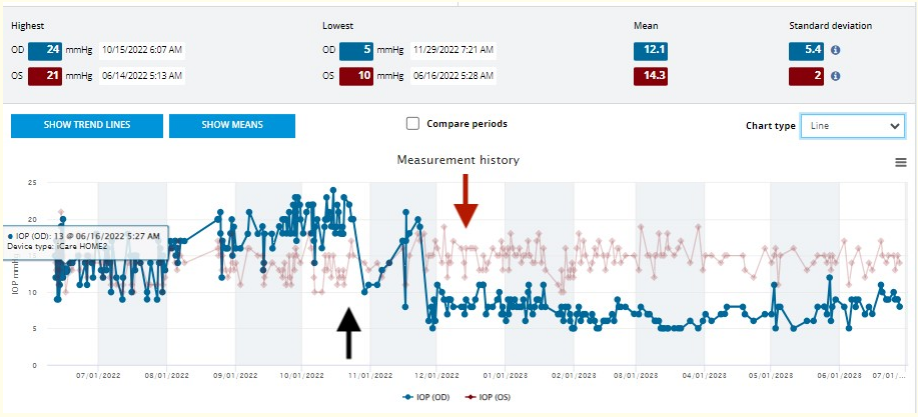

Figure 2: Portal snapshot of patient's IOP measurements of the right eye (blue) and the left eye (red) with the iCare HOME2 tonometer from 6/11/22 to 6/28/23. A black arrow denotes a precipitous drop of right eye pressure around 10/24/22 that corresponds to placement of her tube shunt. A red arrow corresponds to the visit during which the rip-cord suture was removed.

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