

ECP for the Treatment of a Cyclodialysis Cleft in a Pediatric Patient

BY MAHMOUD A. KHAIMI, MD

CASE PRESENTATION

An 8-year-old boy was struck in the eye with a paddleball and referred to the Dean McGee Eye Institute/University of Oklahoma in Oklahoma City. He was previously observed for 3 months and underwent several examinations under anesthesia in an attempt to diagnose a cyclodialysis cleft, but the pediatric ophthalmologist was not able to clearly visualize a cleft. The patient had a visual acuity of 20/20 before the accident and, 4 months prior to his presentation, had a visual acuity of 20/200, hypotony maculopathy, and a swollen optic nerve due to the hypotony (Figure 1). I was unable to diagnose a cyclodialysis cleft in the office with gonioscopy, because the eye had a shallow anterior chamber. Additionally, it can be difficult to perform gonioscopy on pediatric patients in a clinical setting. Ultrasound biomicroscopy was also inconclusive for a cyclodialysis cleft (Figure 2).

HOW WOULD YOU PROCEED?

How would you diagnose and treat a cyclodialysis cleft in an 8-year-old patient who sustained ocular trauma and had a visual acuity of 20/200, hypotony maculopathy, and a swollen optic nerve due to the hypotony?

- Would you use gonioscopy to visualize the angle system?
- Apply a cycloplegic eye drop and dilate the pupil to close the cleft?
- Use an argon laser to visualize the cleft, perform laser ablation, and incite inflammation to cause scarring and close the hole?
- Suture the cyclodialysis cleft closed?



Figure 1. Funduscopy examination of the right eye revealed macular striae with surrounding retinal edema (orange arrows) and marked optic nerve head edema (black arrow). The funduscopy examination of the left eye was unremarkable.

SURGICAL COURSE

I chose to diagnose the cyclodialysis cleft with a laser microendoscope (Endo Optiks) and then treat the cleft with endoscopic cyclophotocoagulation (ECP). In the OR, I placed a small amount of viscoelastic in the anterior chamber to deepen it. I then used a three-piece mirror lens to find the cleft, which was fairly small. I entered the eye with the ECP probe (Endo Optiks), revisualized the cleft, and then applied laser treatment at the area of the cleft and to the tissues just adjacent to it. I did not treat to any visible endpoint; I stopped the laser application when I felt confident that enough laser energy had been applied.



OUTCOME

Three weeks after treatment, the patient's IOP spiked into the mid-50s, signifying closure of the cleft. The patient had been forewarned that a significant

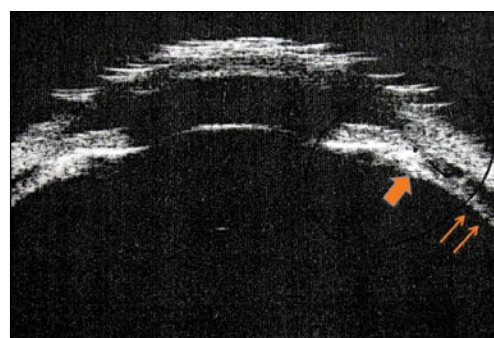


Figure 2. Ultrasound biomicroscopy performed during the examination under anesthesia did not definitively locate or demonstrate the extent of the suspected cyclodialysis cleft. Findings included shallow choroidals extending 360° (small arrows) and an area suggestive, but not conclusive, of a cyclodialysis cleft (large arrow).

elevation in IOP could happen. He was treated with topical IOP-lowering eye drops. His visual acuity returned to 20/20, and his swollen optic nerve and hypotony maculopathy completely resolved. Within a few months of the treatment, the patient was off all glaucoma medications with an IOP in the teens.

DISCUSSION

A cyclodialysis cleft is a separation of the ciliary body from the scleral spur, which allows aqueous humor to flow from the anterior segment into the suprachoroidal space, subsequently causing low IOP. Cyclodialysis clefts, which can occur after trauma or a surgical complication, are frustrating for glaucoma specialists, because raising the IOP contradicts the care they typically provide and can be difficult to accomplish. The dilemma of treating a cyclodialysis cleft, especially in a traumatic case, is identifying its location. In a classic scenario of hypotony or low IOP after trauma, a ruptured globe must be ruled out. Even when the practitioner has a high level of suspicion, a cyclodialysis cleft may be challenging to identify in an office setting, because gonioscopy can be difficult to perform there, and because the anterior chamber is shallow when the IOP is low. Gonioscopy is primarily used to diagnose a cyclodialysis cleft by visualizing the angle system of the eye and identifying a small or a large cleft. If the ophthalmologist has difficulty performing gonioscopy in the office, he or she can examine the patient in the OR under anesthesia.¹ Some clinicians will inject viscoelastic in the office to facilitate visualization of a cleft in a hypotonous eye, but this should only be done in cooperative patients and exclusively in adults.

Typically, aqueous travels through the eye's natural outflow system, which has some resistance. A cyclodialysis cleft creates a secondary path with essentially no resistance by which aqueous humor can leave the eye. Aqueous naturally follows the path of less resistance, thus drastically lowering IOP. The goal of treating a cyclodialysis cleft is to eliminate the secondary avenue.

The classic treatment paradigm for a small cyclo-dialysis cleft of less than 4 clock hours is to dilate the pupil with cycloplegic eye drops to reoppose the ciliary body to the scleral spur. Argon laser treatment is a second treatment modality if the cycloplegic eye drops do not work. The surgeon visualizes the cleft, applies a high amount of laser energy, and thus incites enough inflammation to cause scarring and eventually close the hole. The third treatment paradigm is to suture the

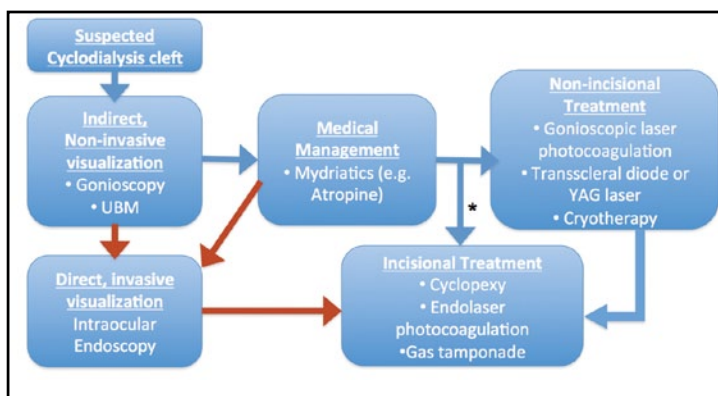


Figure 3. Diagnostic and treatment options for cyclodialysis clefts. The blue arrows represent first-line management therapies. *Incisional treatments should be considered for large clefts. If medical treatment is unsuccessful or a definitive diagnosis has not been made, a direct diagnostic approach may be considered (orange arrows).

cyclodialysis cleft closed via direct cycloplexy. Suturing is a more invasive procedure than the aforementioned options and is usually reserved for clefts larger than 4 clock hours and those that do not respond to conservative medical and laser therapy.²

I was introduced to ECP 8 years ago. Like many other eye care professionals, I used ECP to lower IOP. After becoming accustomed to performing ECP, I considered other applications. Practicing at a tertiary care center at an eye institute based at a university, I am exposed to many different, interesting cases, including cyclodialysis clefts. It was tremendously rewarding to help a patient suffering from a serious condition early in his life. This is also the first case for which I used the ECP probe to definitively diagnose and treat a cyclodialysis cleft. I have since used ECP to diagnose cyclodialysis clefts in several trauma cases marked by chronic hypotony and poor vision. Each of these cases has resolved successfully, leading me to believe that visualization with an endoscope and treatment via ECP is an effective option that has not been associated with significant complications for managing cyclodialysis clefts (Figure 3). ■

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