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DMEK with endophotocoagulation and cyst wall removal for corneal endothelial decompensation due to iris cyst

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ABSTRACT

Purpose: Iris cysts may arise secondary to surgical or nonsurgical trauma, potentially leading to corneal decompensation via mechanical injury to the adjacent endothelium. However, no well-established protocol exists for the treatment for corneal edema arising therefrom.

Observations: A 58-year-old white male presented with an iris mass of his left eye; it occupied 1/3rd the anterior chamber volume and directly contacted the corneal endothelium. The cornea was diffusely edematous, and best corrected visual acuity (BCVA) measured 20/70 (0.3). Corneal endothelial decompensation secondary to iris cyst was diagnosed. Treatment consisted of endophotocoagulation and vitrectomy probe removal of the cyst wall, with Descemet membrane endothelial keratoplasty (DMEK) also performed as a single, combined procedure. The patient subsequently experienced a resolution of his corneal edema and disappearance of his iris cyst, without recurrence of either condition. BCVA improved to 20/25 (0.8).

Conclusions and importance: Iris cyst may be a rare cause of corneal decompensation. Viable treatment may entail a single-stage procedure involving endophotocoagulation and vitrectomy probe application to the cyst wall combined with DMEK.

1. Introduction

In adults, iris cysts are typically secondary to surgical or nonsurgical ocular trauma.[1] With progressive growth, various mechanical complications may arise, including corneal endothelial decompensation.[2] Preferred management of cyst-related corneal edema has yet to be established. Here, we describe a recent case of corneal edema caused by an iris cyst, successfully treated in a single procedure with endophotocoagulation and vitrectomy probe revision of the cyst wall, combined with Descemet membrane endothelial keratoplasty (DMEK).

2. Case report

A 58-year-old white male was referred for management of a recurrent iris cyst of the right eye. This cyst had been diagnosed 10 years previously, believed to be secondary to prior complicated cataract surgery. Due to progressive growth, multiple treatments with Nd:YAG laser to the cyst wall had been administered, either with no effect or with rapid recurrence. Over time, the patient had developed symptoms consistent with corneal edema including blurred vision (Fig. 1). The diagnosis of corneal endothelial decompensation secondary to recurrent iris cyst was confirmed, and a treatment plan was devised involving cyst wall revision combined with endothelial keratoplasty.

Intraoperatively, the anterior chamber was filled with cohesive ophthalmic viscosurgical device and a 20G diode endolaser photocoagulator (Endo Optiks E2, Beaver Vistec) was inserted via a 3.0mm clear corneal incision (Fig. 2, Video 1). Laser was applied diffusely to the anterior and lateral aspects of the cyst and to the immediately surrounding iris (196 spots; 215 mW power; 50 milliseconds duration) as previously described.[3] A 25G vitrectomy probe was then used to remove the anterior cyst wall. Subsequently, the anterior chamber was filled with air and a reversed Sinskey hook was used to perform recipient descemetorhexis. The donor DMEK graft was delivered into the anterior chamber and unfolded via indirect manipulations. Once completely unfolded, the graft was lifted to the posterior corneal surface atop an air bubble, and the operation was concluded.

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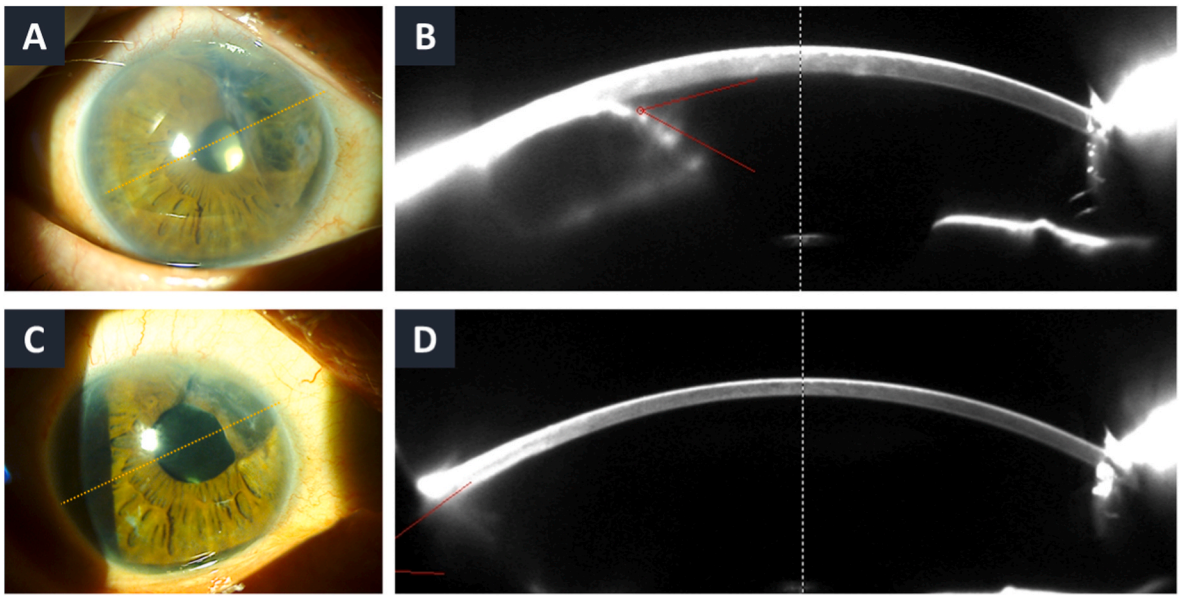

Fig. 1. Preoperative slit lamp biomicroscopy photograph of decompensated cornea secondary to iris cyst (**A**) and Pentacam based scheimpflug image demonstrating the iris cyst and overlying corneal edema (**B; dashed yellow line indicating scan axis**). By 6 months postoperatively after iris cyst removal with concurrent DMEK, the iris cyst has not recurred and the cornea remains thin and clear (**C,D**). (For interpretation of the references to colour in this figure legend, the reader is referred to the Web version of this article.)

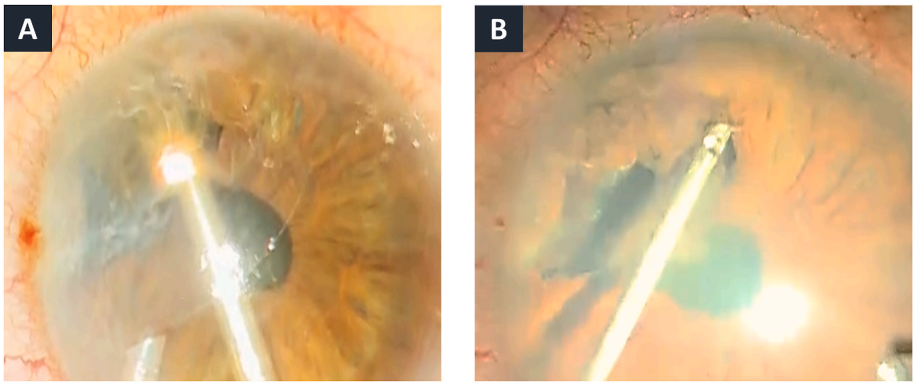

Fig. 2. The iris cyst and surrounding iris stroma are initially treated with diode endolaser (**A**) and subsequently the anterior wall of the cyst is removed via vitrectomy handpiece (**B**).

Mild anterior chamber reaction and limbal injection were evident for 2 weeks after surgery. Otherwise, no intra- or postoperative complications were experienced. The prescribed postoperative medical regimen consisted of 4 times daily topical moxifloxacin for one week and prednisolone acetate 1% 8 times daily, tapered to 3 times daily over the first 4 months.

By 1 month postoperatively, the operated cornea was thin and clear with a well attached DMEK graft and a normal appearing endothelial cell mosaic, although precise endothelial cell counts were not available. Through 6 months of postoperative follow-up, the iris cyst has not recurred (Fig. 1). At every postoperative examination, intraocular pressure measured by applanation tonometry was measured at <21 mmHg, without supplemental pressure lowering medication.

Supplementary video related to this article can be found at https://doi.org/10.1016/j.ajoc.2022.101417

3. Discussion

Whereas most primary iris cysts are small, stable, and asymptomatic, secondary iris cysts (i.e., those arising from prior ocular trauma) may progressively enlarge resulting in possible complications including angle closure glaucoma and corneal endothelial decompensation.[1,2] Various treatments have been described, including surgical iridectomy and injection of absolute alcohol into the cyst lumen.[4–6] However, there is no standard protocol for the management of corneal edema in the setting of an existing iris cyst, and the above-mentioned techniques may be poorly suited for a combined procedure in which endothelial keratoplasty would also be planned. For example, injection of absolute alcohol may carry the risk of leakage/reflux into the surrounding anterior chamber with potential toxicity to the donor graft, and surgical iridectomy may render DMEK unfolding (already technically challenging) especially problematic.

The use of photocoagulation to treat iris cysts via argon, Nd:YAG, and ab externo/endoscopic diode lasers has been previously reported.[3,7–9] Compared to en bloc cyst excision, photocoagulation to the cyst wall may be relatively tissue sparing and be less dependent on surgeon skill.

Supplementing diode laser with vitrectomy probe removal of the anterior cyst wall may further reduce the risk of cyst recurrence.[4] In addition, these treatments may pair well with combined DMEK surgery,

permitting the patient's cyst and corneal edema to be treated simultaneously.

Endophotocoagulation may occasionally be associated with significant postoperative inflammation, so, there was concern whether the donor DMEK graft would be affected. Fortunately, however, while mild anterior chamber reaction was observed in the immediate postoperative period, the patient's inflammation could be adequately controlled via topical steroid therapy, with no apparent effect on the appearance or function of the donor membrane.

4. Conclusions

In conclusion, iris cysts may occasionally precipitate corneal decompensation. If so, both the iris cyst and the corneal edema may be treated via diode endolaser, vitrectomy probe cyst wall removal, and DMEK, performed together as a single-staged procedure.

Patient consent

Written consent to publish this case has not been obtained. This report does not contain any personal identifying information.

Authorship

All authors attest that they meet the current ICMJE criteria for Authorship.

Declaration of competing interestCOI

Jack Parker is a consultant for Glaukos and EyeVance. The following authors have no financial disclosures: SA, EK, DD, JP.

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