• Letter to the Editor •

# Successful treatment of epithelial downgrowth with endoscopic photocoagulation and intracameral 5-fluorouracil after prolonged limbal wound leak

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**Dear Editor,**

Epithelial downgrowth (EDG) is an uncommon and serious complication of intraocular surgery and trauma[1]. It is recognized clinically by a translucent membrane on the corneal endothelium or iris. Treatment of EDG is controversial and generally has a low success rate. Recent treatment modalities have been invasive and damaging to the anatomy of the eye[1].

More recently, the use of intracameral 5-fluorouracil (5-FU) has been discussed[2] and treatment of EDG with endoscopic cyclophotocoagulation (ECP) has been attempted[3]. These reported cases eventually required a corneal transplant for visual rehabilitation. We herein present a case of EDG developing after prolonged limbal wound leak in an eye with a Baerveldt tube implantation for uncontrolled congenital glaucoma, which was successfully treated with ECP, peeling of epithelial membrane, excision of limbal fistula, a corneoscleral lamellar graft at the fistula and intracameral 5-FU without the need for a corneal transplant.

A 26-year-old lady with underlying bilateral congenital glaucoma, presented to us in April 2016 with sudden drop of right eye vision from 6/24 to perception of light (PL), associated with gushing of fluid from the eye, 2mo after a Baerveldt tube insertion. She had prior history of multiple surgeries including an Ahmed valve implantation that later failed.

Examination revealed a severely hypotonous eye and leakage from where the Baerveldt tube entered the anterior chamber. She underwent globe reformation with a sceral patch. However, the leak persisted despite multiple attempts of re-suturing and patching. Subsequently she developed signs of intraocular infection. The Baerveldt tube had to be explanted and she was treated with intravitreal and systemic antibiotics. Post explantation, the leaking persisted possibly from a limbal fistula. Her eye was soft for approximately 6wk.

A week after tube explantation, we noted a translucent membrane involving the superior part of posterior corneal surface (Figure 1). It gradually grew towards the central cornea over a period of several days. The diagnosis of EDG was made based on that clinical finding, possibly through the limbal fistula.

The EDG was initially treated with a diode photocoagulation by using an endoscopic probe normally used for photocoagulation of the ciliary body (E2 laser with curved endoscopic probe; EndoOptiks, Little Silver, NJ, USA) through a 3-mm clear cornea incision opposite the presumed limbal fistula. We ablated any visible membranous epithelial tissue in the anterior segment. A total of 20 shots of diode laser with the power setting of 0.1-0.2 mW were targeted towards the translucent membrane.

Postoperatively, the membrane seemed to halt from progressing. However, three weeks later, it appeared to grow further. Additional surgery to remove the EDG and closure of the fistula was performed. The translucent membrane was peeled off from the endothelium and the limbal fistula was trephined and 2 mm tissue was excised. A corneal graft was sutured at the trephined area. Then intracameral injection of 0.3 mg 5-FU in 0.3 mL of DisCoVisc (Alcon Laboratories Inc., Texas, USA) was given. Only 0.15 mL of the mixture was injected into the superior part of the anterior chamber.

Postoperatively, there was no regrowth of the membrane but the lens started to become cataractous requiring lens extraction. Post lens aspiration, she continued to improve slowly and her vision at 6mo postoperatively returned to 6/24, similar to her premorbid vision, albeit some reduction in color contrast. There was no clinical evidence of recurrent EDG after 8mo (Figure 2) and 15mo (Figure 3). We could not measure the

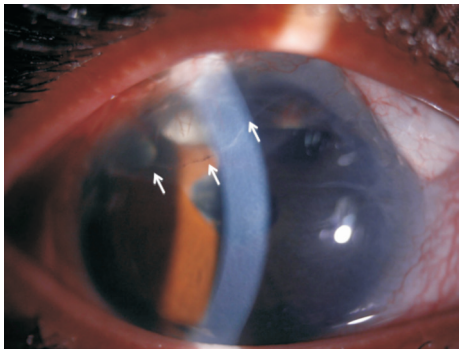

**Figure 1 Extending line of EDG (white arrows).**

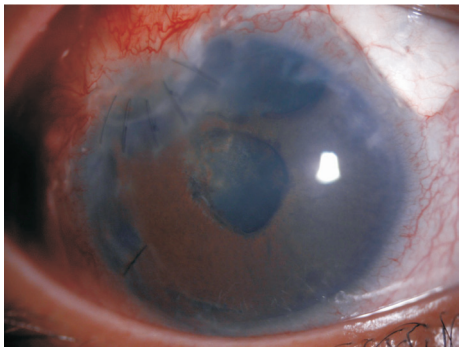

**Figure 2 Anterior segment photograph at 8mo postoperatively** There was no evidence of recurrent EDG.

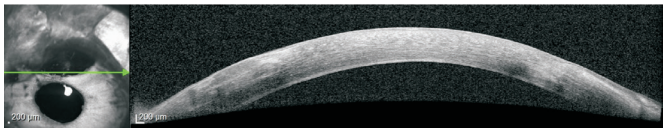

**Figure 3 Anterior segment OCT at 15mo postoperatively.**

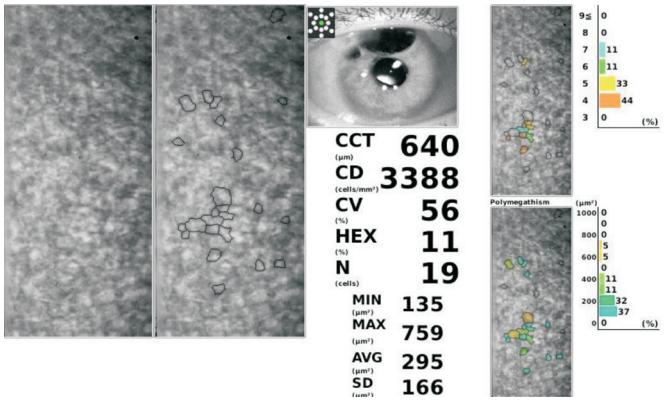


**Figure 4 Endothelial cell count at 15mo postoperatively.**

endothelial cell count preoperatively as the cornea was too hazy (Figure 4). At 15mo postoperatively, the endothelial cell count was 3388 cells/mm$^2$, but we think this count is inaccurate possibly due to limited corneal clarity or changes in endothelial cell morphology for successful measurement.

No single means of treating EDG can be singled out as most successful. Complex surgical procedures have been described to manage diffuse EDG[4]. Our case was treated with 2 stage procedures. Initially the epithelial membrane was ablated with endoscopic photocoagulation. The use of argon laser has been reported[5], but the use of diode laser *via* the ECP probe is less invasive and can minimize collateral damage. The endoscope allows direct visualization and is more precise in ablating the membrane.

Although most of the epithelial sheet has been treated with ECP, the limbal fistula that provides communication for the epithelial cells to enter the anterior chamber persisted. She therefore underwent a second procedure where the fistula was trephined and covered with corneal graft. Intracameral 5-FU injection further eradicate any remaining viable epithelial cells to provide complete resolution of EDG[2]. Unlike previously reported cases of the use of ECP[3], our patient improved without the need of cryoablation and penetrating keratoplasty.

Potential 5-FU toxicity to corneal endothelium in an important consideration. However its effect has never been fully established and remained to be defined. Its effect in an *in vitro* animal model has been studied where they suggest that the threshold concentration for fluorouracil toxicity to corneal endothelium lies between 1 and 10 mg/mL when exposed time is four hours[6]. Wong *et al*[7] reported a nearly identical endothelial cell count to the measurement before injection after 1y of injecting 5-FU in the management of EDG after Descemet stripping automated endothelial keratoplasty.

In conclusion, the use of endoscopic laser technique together with excision of the fistula and intracameral 5-FU provides a favorable outcome to our patient. Endoscopic photocoagulation offers an effective and less invasive treatment option for EDG, while intracameral 5-FU provides more complete eradication of viable epithelial cells. Meticulous attention should be given to wound closure in any intraocular surgeries. Wound leaks should be evaluated carefully to reduce fistula development.

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**REFERENCES**

1 Weiner MJ, Trentacoste J, Pon DM, Albert DM. Epithelial downgrowth: a 30-year clinicopathological review. *Br J Ophthalmol* 1989;73(1):6-11.

2 Ni N, Goldberg MA, Eagle RC Jr, Rapuano CJ, Haller JA. Epithelial downgrowth after intraocular surgery treated with intracameral 5-Fluorouracil. *Case Rep Ophthalmol Med* 2015;2015:325485.

3 Jadav DS, Rylander NR, Vold SD, Fulcher SF, Rosa RH Jr. Endoscopic photocoagulation in the management of epithelial downgrowth. *Cornea* 2008;27(5):601-604.

4 Maumenee AE, Paton D, Morse PH, Butner R. Review of 40 histologically proven cases of epithelial downgrowth following cataract extraction and suggested surgical management. *Am J Ophthalmol* 1970;69(4):598-603.

5 Lee BL, Gaton D, Weinreb RN. Epithelial downgrowth following phacoemulsification through a clear cornea. *Arch Ophthalmol* 1999;117(2):283.

6 Mannis MJ, Sweet EH, Lewis RA. The effect of fluorouracil on the corneal endothelium. *Arch Ophthalmol* 1988;106(6):816-817.

7 Wong RK, Greene DP, Shield DR, Eberhart CG, Huang JJ, Shayegani A. 5-Fluorouracil for epithelial downgrowth after Descement stripping automated endothelial keratoplasty. *Cornea* 2013;32(12):1610-1612.