CASE REPORT

Deep anterior lamellar keratoplasty for an intrastromal epithelial corneal cyst: a case report

Corneal cysts, usually caused by the displacement of epithelium into the substance of the cornea, were first described in 1853.[1] Congenital or traumatic factors may contribute to the formation of corneal cysts.

Intrastromal corneal epithelial cysts are rare. Mifflin et al.[2] reported only 16 cases in the literature from 1971 to 2001. Once intrastromal progression of the epithelium within these lesions obscures the visual axis, surgical intervention is required. Known surgical methods include simple cyst aspiration and drainage, cyst wall excision, washing of the cyst cavity with distilled water or balanced salt solution, chemical and electrical cautery, cryotherapy, and lamellar or penetrating keratoplasty.[3] Unfortunately, surgery may induce negative visual consequences, and recurrence of these cysts is common.

Here, we report a case of an intrastromal corneal cyst after corneal laceration suturing surgery that was treated with deep anterior lamellar keratoplasty (DALK).

Case Report

A 25-year-old male was referred to our hospital complaining of mildly decreased visual acuity in his left eye. Ten years earlier he had suffered ocular trauma in his left eye from an awl (a small pointed tool used for piercing holes) and underwent corneal laceration suturing at a local hospital. His medical records showed a corneal opacity in the injured eye. During the previous 6 years, he had noticed a slow progressive growth of corneal opacity in the centre of this eye. He had no history of other diseases or medication use.

Ocular Examination

His visual acuity was 0.04 in the left eye. Anterior segment assessment, including slit-lamp biomicroscopy, anterior segment optical coherence tomography (AS-OCT; Visante; Carl Zeiss Meditec, Jena, Germany), and in vivo confocal microscopy (Heidelberg Retina Tomograph II with Rostock Cornea Module; Heidelberg Engineering, Dossenheim, Germany), was performed.

Slit-lamp biomicroscopy showed an avascular, cream-colored cystic lesion located in the centre of the left cornea, which extended from the anterior to deep stroma. The lesion was 6 mm in diameter, presenting a hypopyon-like appearance in the superior part of the cyst (Fig. 1). Some irregular small cysts (about 2 mm in diameter) with anterior adhesion of the iris could be seen at the 5 o'clock corneal limbus, which communicated with the central cyst. The pupil was not round because of a direction shift at the 5 o'clock corneal limbus.

AS-OCT revealed that the cyst cavity extended almost to the Descemet's membrane (Fig. 2). In vivo confocal microscopy showed that the epithelium, anterior stroma layer, and endothelium of the corneal lesion were normal; a large number of Langerhans cells were observed in the subepithelial nerve fibre layer, and a scar was found in the posterior stromal layer (Fig. 3).

We therefore made a diagnosis of an epithelial inclusion cyst secondary to epithelial infiltration of the stroma. Considering the location of this large corneal cyst and the potential influence on central visual acuity, we performed DALK for this patient.

Surgical Treatment

DALK was successfully performed by removing the corneal stroma of the involved eye and transplanting a donor button. The donor corneal button was from a donor eye preserved in the eye bank at our hospital. The cyst at the limbal margin was punctured by a 21-gauge needle. We carefully aspirated 0.1 mL of an opaque viscous fluid for pathological analysis.

The patient's cornea was partially trephined with an 8.0-mm trephine. Then we dissected the corneal stroma layer by layer until the Descemet's membrane was exposed. The remaining cyst cavity in the temporal rim of the cornea was drained and irrigated with balanced salt solution, and its wall curetted mechanically. The irregular small cysts at the 5 o'clock corneal limbus did not enter the anterior chamber. The donor corneal button (the same size as the removed endodermis) was sutured into the recipient bed using 10-0 nylon sutures and attached well to the recipient cornea. After the procedure, an antibiotic–steroid ointment was administrated, and the eye was patched and shielded.

Microscopy of the aspirate showed edematous epithelial cells together with a small amount of cell debris. Histology of the corneal lesions showed a distribution of monolayer and stratified epithelial cells in the corneal stroma, forming a cavity.

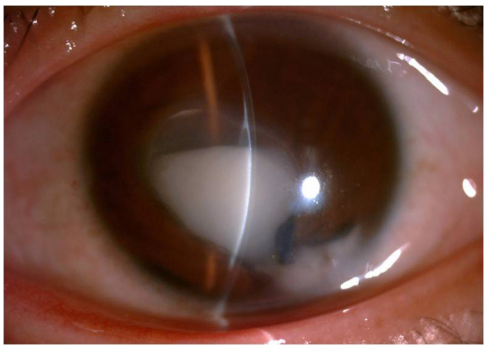

Fig. 1—Preoperative slit-lamp photograph showing an avascular, cream-colored cystic lesion in the left cornea extending from the anterior to deep stroma. Irregular small cysts can be seen at the 5 o'clock limbus, as well as anterior adhesion of the iris and communication with the central cyst.

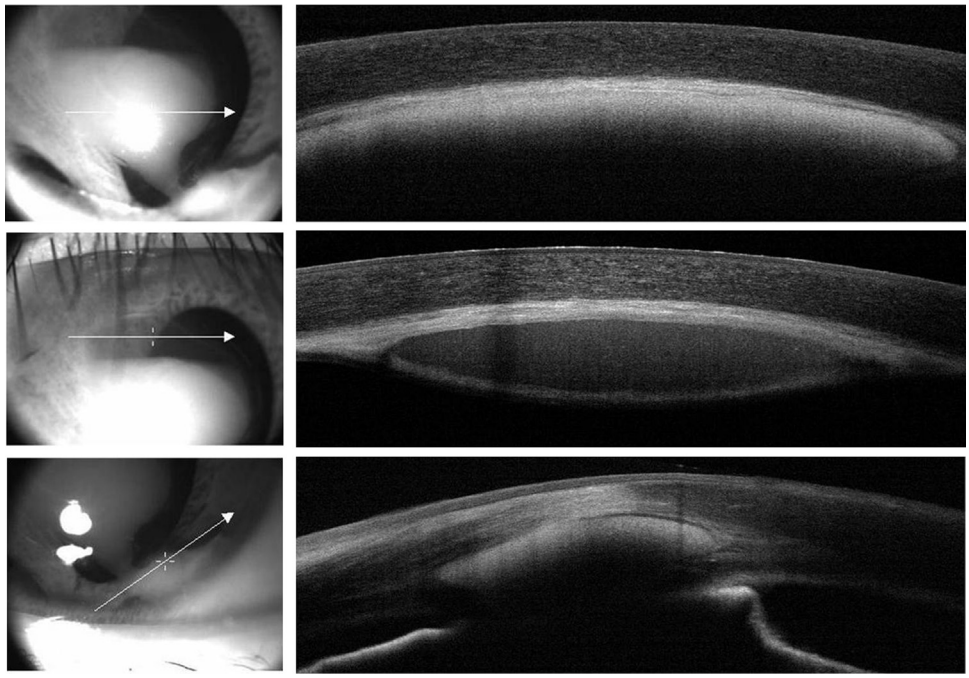

Fig. 2—Anterior segment optical coherence tomography showing extension of the corneal cyst cavity near the Descemet's membrane.

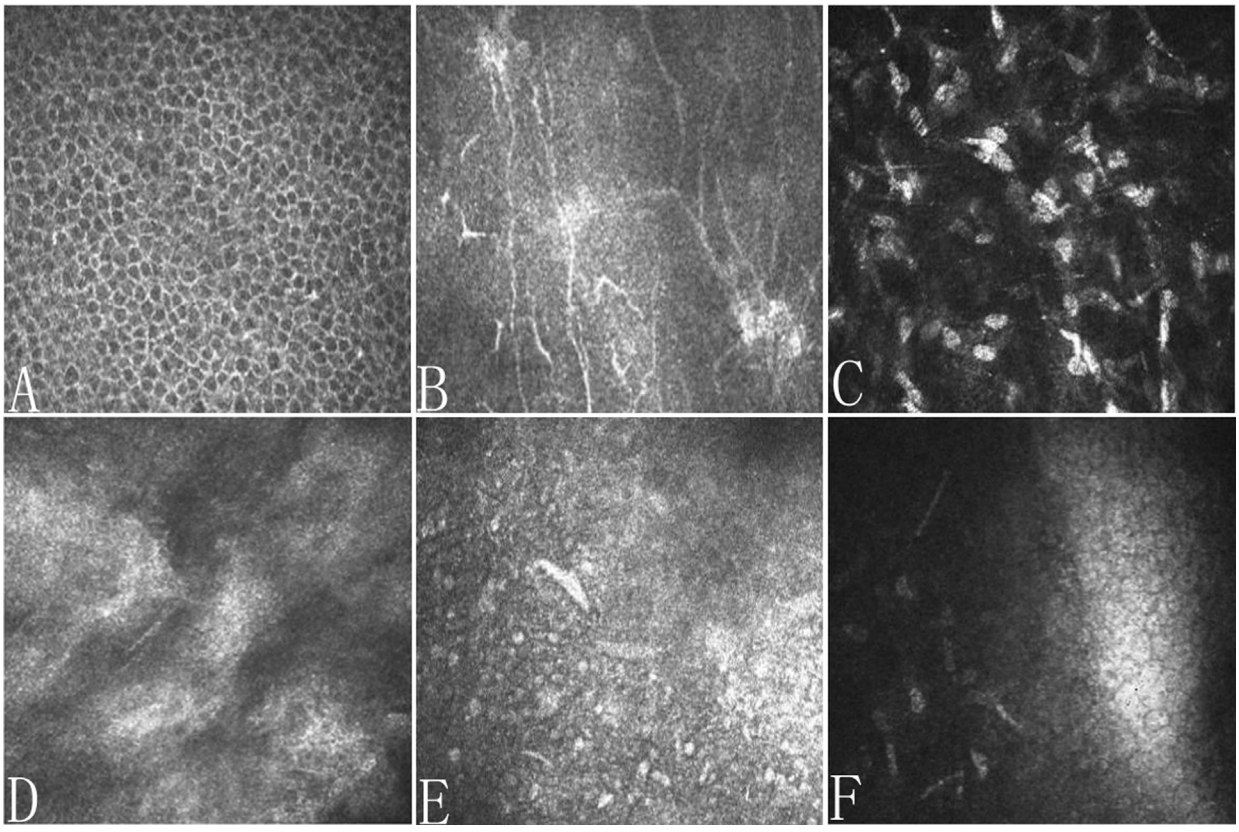

Fig. 3—Corneal confocal microscopy of the left eye showing (A) normal epithelium of corneal lesion, (B) coarse subepithelial nerve fibre structure and a large number of Langerhans cells, (C) normal anterior stroma layer, (D) posterior stromal layer scar formation, (E) no pathogens, and (F) no abnormalities in the corneal endothelium of the peripheral transparent region.