Descemet-stripping automated endothelial keratoplasty after bee sting of the cornea

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We present a case of corneal decompensation and cataract formation following a corneal bee sting in a patient with a history of drug abuse. Clinical findings, anterior segment photographs, and medical and surgical treatment are presented. The stinger was removed from the cornea. Systemic and topical steroids, topical antibiotics, and systemic and topical antiglaucoma medication and antihistamines were prescribed. After 3 months, combined Descemet-stripping automated endothelial keratoplasty (DSAEK), phacoemulsification, and intraocular lens implantation were performed, with significant improvement in visual acuity and corneal edema. To our knowledge, this is the first report of DSAEK combined with cataract surgery for this condition. It was found to be a safe and effective treatment for corneal decompensation secondary to a bee sting.

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Bee and wasp stings of the globe are rare occurrences. The most common site is the cornea. Ocular findings following this type of injury range from mild tissue edema and hyperemia to severe visual loss.1 We present a case of corneal decompensation and cataract formation following corneal bee sting treated surgically by removal of the cataract and Descemet-stripping automated endothelial keratoplasty (DSAEK).

CASE REPORT

A 36-year-old man presented to our emergency department with a chief complaint of a bee sting to the right eye that occurred 1 hour before presentation. The medical history was unremarkable except for drug abuse.

On examination, the corrected distance visual acuity (CDVA) was 20/40 in the right eye and 20/20 in the left eye. Swelling of the eyelids was apparent. Slitlamp biomicroscopic examination revealed conjunctival chemosis. A dense stromal corneal infiltrate with the stinger and venom sac attached was retained in the center of the infiltrate (Figure 1), located temporally, adjacent to the limbus at 8 o’clock. There were Descemet folds and 4+ cells in the anterior chamber. The stinger was removed at the slitlamp using forceps.

Two hours later, the intraocular pressure (IOP) was 30 mm Hg and quickly increased to 50 mm Hg. The patient was admitted and started on topical antibiotics (moxifloxacin 8 times per day), topical and systemic steroids (prednisolone acetate [Pred-Forte] hourly and intravenous methylprednisolone [Solu-Medrol] 250 mg 4 times per day for 2 days followed by oral prednisone 1 mg/kg), and topical cycloplegic (cyclopentolate 1%) and topical and systemic antiglaucoma and antihistamine medications.

On day 3, the CDVA visual acuity dropped to hand motion and a large corneal epithelial defect and 0.3 mm hyphema in the anterior chamber were noted, with worsening of the corneal edema. Inverse relative afferent pupillary defect (RAPD) was negative. On day 10, painful bullous keratopathy and an anterior and posterior subcapsular cataract were diagnosed. The IOP was controlled at this point, and antiglaucoma medications were discontinued.

No improvement in bullous keratopathy was noticed during 3 months of follow-up despite topical treatment with steroids and sodium chloride 5% drops 4 times per day. Specular microscopy failed to demonstrate endothelial cells.

At 3 months, a triple procedure including DSEAK, phacoemulsification, and posterior chamber intraocular lens (IOL) implantation (clear corneal incision superiorly at 12 o’clock) were performed. The surgery was uneventful.

One day postoperatively, the disk was dislocated inferorly and repositioning of the disk together with rebubbling of the anterior chamber were performed. The disk was almost completely attached on the next day. Four months postoperatively, the disk was attached, the cornea was clear (Figure 2), and the CDVA was 20/80 (−2.00 −2.00 × 180). Compliance with treatment was very limited throughout the entire clinical course.

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DISCUSSION

Bee stingers are modified ovipositors (egg-laying organ of the female bee), usually withdrawn into the abdomen when not in use. Bees use the stinger as a defensive weapon to inject venom into the victim’s body while leaving the stinger and attached venom sac in the victim’s tissue. Corneal bee stings are rare but have potentially devastating ocular and visual outcomes.

Reported complications of corneal bee stings include anterior and posterior segment complications such as conjunctival chemosis and hyperemia, corneal edema, corneal infiltrate and bullous keratopathy, uveitis, hyphema, hypopyon, iris atrophy and depigmentation, lens subluxation, anterior and posterior lens capsule opacities and cataract formation, optic neuritis, papilledema, retrobulbar neuritis, and internal and external ophthalmoplegia. Bullous keratopathy is considered to be related to wasp stings rather than to bee stings.

In a corneal endothelial cell analysis performed 1 year after a corneal bee sting, Gürlü and Erdal reported a substantial decrease in endothelial cell density (ECD) compared with the fellow eye, presumed to be caused by toxins in the bee venom. Chuah et al. also reported a substantial decrease in ECD compared with the fellow eye 8 months following a corneal bee sting. Repeated specular microscopy examinations of our patient’s cornea failed to demonstrate a normal appearance of endothelial cells and ECD measurement was not possible.

Our patient presented to the emergency room with a toxic corneal infiltrate, mild corneal edema, elevated IOP, and uveitis but rapidly developed severe corneal edema, hyphema, cataract, and iris atrophy. On follow-up, painful bullous keratopathy and cataract were treated with combined DSAEK, phacoemulsification, and IOL implantation. Despite the known advantages of DSAEK over penetrating keratoplasty, in an unreliable patient one should consider small-incision lamellar surgery because of the reduced likelihood of globe rupture in the future. To our knowledge, this is the first reported case of DSAEK for this indication.

Except for the known ocular morbidity of corneal bee sting, our patient presented a treatment challenge due to his substance abuse, low tolerance of pain, and very poor compliance with treatment. Although DSAEK was successful, visual recovery was partial. We believe the patient’s poor compliance might be attributable to that. It is also possible that damage that could not be quantified occurred to the macula or fovea. Fortunately, the patient was treated early with systemic steroids, which may have prevented the development of optic neuropathy in this case (ie, inverse RAPD was negative).

To conclude, a corneal bee sting can have a devastating outcome and should be treated vigorously. Descemet-stripping automated endothelial keratoplasty combined with cataract surgery seems to be a safe and effective treatment option for corneal decompensation and cataract formation secondary to a bee sting.

REFERENCES


Figure 1. Anterior segment photograph showing eyelid swelling, marked chemosis, and bee sting with venom sac stuck in the center of a dense peripheral corneal infiltrate.

Figure 2. Anterior segment photograph 4 months postoperatively. Note the relatively clear cornea with attached disk (DSAEK), remnant of the peripheral toxic infiltrate in the cornea at 7 o’clock, and irregular pupil with peripheral anterior synechia at 5 o’clock.

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