

## Acute Keratoconus-Like Corneal Hydrops Secondary to Ocular Massage Following Trabeculectomy

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### Abstract

**Purpose:** To report a case of acute keratoconus-like corneal hydrops in a patient with long-term ocular massage following trabeculectomy.

**Methods:** Case report and review of medical literature.

**Results:** A rare complication of acute keratoconus-like corneal hydrops occurred in a patient following the use of ocular massage to maintain satisfactory aqueous humor filtration after trabeculectomy. The patient had a history of high myopia but denied previous ocular trauma, allergic disease and a family history of keratoconus. Slit-lamp examination demonstrated keratoconus-like corneal hydrops with formation of epithelial microcystic, and intrastromal cleft. He was diagnosed with acute corneal hydrops in the right eye and received intracameral gas (16% perfluoropropane) injection. On 5 months follow-up, the corneal edema was significantly improved.

**Conclusions:** There may be a contributory relationship between the long-term post-trabeculectomy massage and the development of acute corneal hydrops. When prescribing therapeutic massage, patients should be followed up carefully to monitor for unexpected complications.

**Keywords:** Trabeculectomy; Ocular massage; Corneal hydrops

### Introduction

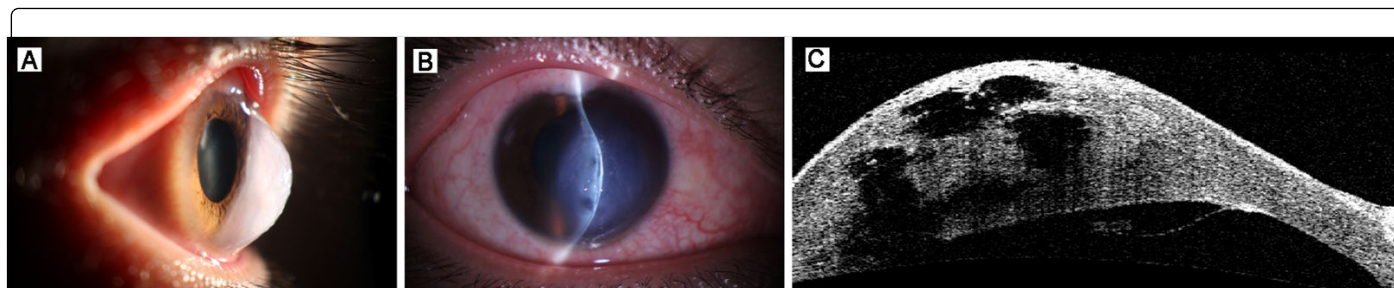
Ocular massage is commonly utilised in the postoperative management of trabeculectomy. Ordinarily, ocular massage is safe and effective with careful monitoring and when appropriate instructions are provided [1]. However, inappropriate massage might be associated with various complications, including bleb rupture, secondary endophthalmitis, iris incarceration, hyphema, subretinal haemorrhage, choroidal haemorrhage, hypotony, shallowing of the anterior chamber [1] and corneal ectasia [2]. To the best of our knowledge, we present the first case report of acute keratoconus-like corneal hydrops secondary to ocular massage following trabeculectomy.

### Case Report

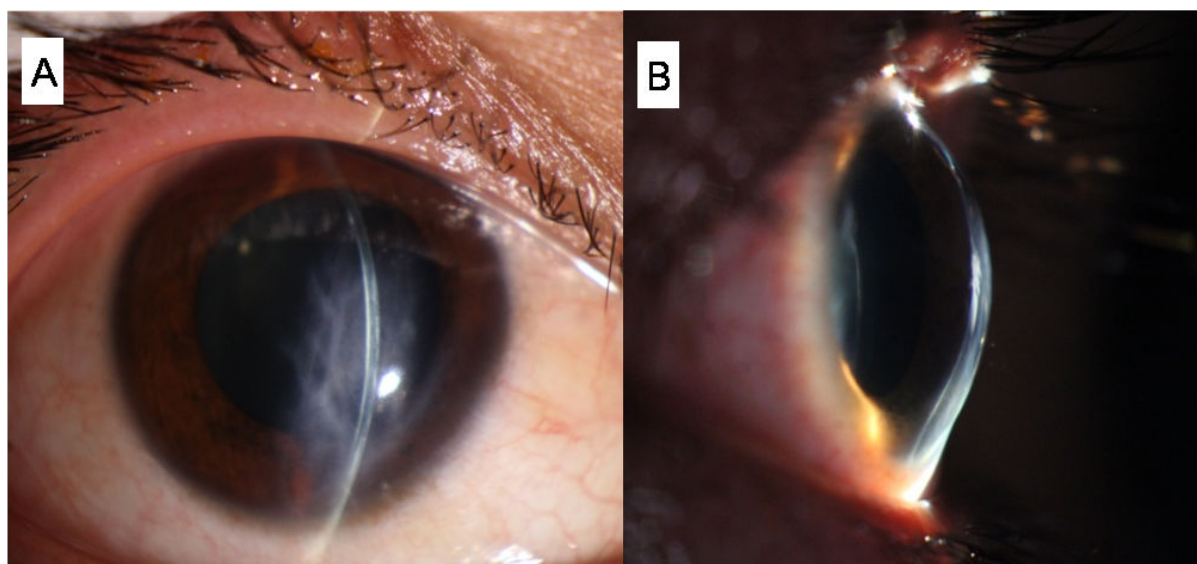
A 23 year old man presented to our glaucoma department with a 1 week history of ocular pain in his right eye. He reported acute ocular pain, redness, tearing, and foreign body sensation immediately after ocular massage. His symptoms had worsened over the previous week before seeking medical attention. The patient had undergone bilateral trabeculectomy due to juvenile open-angle glaucoma in both eyes one year ago and had a history of high myopia since an early age. During the third postoperative week, the IOP in his right eye increased to 43 mmHg due to an encapsulated bleb that developed one month after the surgery. After two needle revisions with 5-fluorouracil, the pressure

decreased and was maintained within the normal range (10~17 mmHg) with once daily ocular massage and without any IOP-lowering medications during the 12-month follow-up period. However, he developed ocular pain and tearing after ocular massage of his right eye (one week before presenting to our department). He denied ocular trauma, symptoms suggestive of allergic disease or a family history of keratoconus.

Upon clinical examination, his visual acuity of the right eye was hand motions, and the IOP in the right eye was not measurable by noncontact tonometer due to severe corneal oedema but was determined to be of normal tension by digital palpation. The VA and IOP of the left eye were stable (as in his previous exam). A slit-lamp examination revealed marked corneal hydrops with bullae formation and a cone-shaped protrusion in the right eye (Figures 1A and 1B). Anterior segment optical coherence tomography indicated breaks in Descemet's membrane and stromal cystic cavities consistent with hydrops (Figure 1C). Slit-lamp and Pentacam examinations revealed no signs of keratoconus in the fellow eye. Based on the clinical manifestations and examinations, the patient was diagnosed with acute corneal hydrops OD. The patient subsequently received two intracameral gas injections (16% perfluoropropane, C3F8; Shanghai Hua Jieshi Medical Equipment Co., Ltd., Shanghai, China) in the right eye. The corneal edema was significantly improved at the 6-week follow-up after the second injection, with no recurrence at the 5-month follow-up (Figure 2).



**Figure 1:** Acute keratoconus-like corneal hydrops on the right eye. Slit-lamp photographs showing acute keratoconus-like hydrops with formation of epithelial microcystic and intrastromal clefts (A and B). Anterior segment optical coherence tomography showing breaks in Descemet's membrane and an intrastromal cyst (C).



**Figure 2:** Slit-lamp photographs of the cornea at 5-month follow-up after treatment.

## Discussion

Ocular massage is a common treatment following trabeculectomy. However, there is no consensus regarding the frequency or duration of massage or the amount of force applied [2]. In addition, the potential risk to the cornea has not been fully recognised. To the best of our knowledge, acute keratoconus-like corneal hydrops secondary to ocular massage following trabeculectomy has not been reported. In most cases, acute keratoconus-like hydrops are seen in eyes with advanced keratoconus due to a tear in Descemet membrane. In our case, it remains unclear whether keratoconus had existed before the onset of hydrops. The examinations prior to trabeculectomy (UBM, refraction) did not demonstrate apparent corneal abnormalities for both eyes (pre-trabeculectomy refraction was -10.00-0.75/30 in the right eye and -8.75 sph in the left eye, without obvious astigmatism in both eyes). And our current examinations of the fellow eye (AS-OCT, Topography and refraction) revealed no signs of keratoconus either. With edema absorption, slit-lamp examination of the right eye didn't suggest the typical signs of advanced keratoconus.

Secondly, it remains unknown whether post-trabeculectomy massage is responsible for the onset of acute corneal hydrops in this

patient. According to the literature, excessive massage can lead to corneal ectasia. A case of post-trabeculectomy massage that resulted in keratectasia was reported in 1996 [3]. In 2002, Lucarelli et al. reported another case of corneal ectasia associated with massage for dacryocystoceles [4]. Also eye rubbing has been implicated in the pathogenesis of keratoconus [5-7]. These facts lead us to suppose that excessive post-trabeculectomy massage may lead to corneal deformation and even breaks in Descemet membrane, causing stromal and epithelial edema. The exact mechanism by which eye rubbing/massage may cause corneal deformation is still unknown.

As discussed above, there might be a contributory relationship between long-term post-trabeculectomy massage and the development of acute corneal hydrops in this case. Although acute corneal hydrops is a rare complication associated with post-trabeculectomy massage, massage-related adverse effects on the cornea must be considered when prescribing therapeutic massage, especially for patients who cannot seek timely medical assistance.

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