

Images in Allergy

Corneal Hydrops Associated with Keratoconus in a Young Girl with Severe Allergic Conjunctivitis

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A 12-year-old girl with severe cognitive impairment who presented with a 6-week history of left eye (LE) whitening, intense eye rubbing, and photophobia. She was diagnosed with keratoconus (KC) in both eyes in another institution 4 years ago. A longstanding history of fluctuating episodes of allergic conjunctivitis accompanied by itchiness, tearing, redness, and eye rubbing, managed intermittently with topical antihistamines, was also described.

Ophthalmic examination revealed a mild Munson and central corneal bulging in the right eye (RE) (Figure 1, A-C). The LE showed a marked Munson sign, corneal opacification secondary to stromal edema, corneal bulging, and diffuse superficial punctate keratitis (Figure 1, D-F). Lid eversion showed a papillary reaction at the inferior and superior palpebral conjunctiva. A diagnosis of acute corneal hydrops (ACH) was confirmed. Sodium chloride 5% eyedrops and topical steroids were prescribed in the LE to reduce corneal edema and inflammation. Cold compresses and topical olopatadine 2% twice a day were initiated to manage the AC symptoms and reduce eye rubbing. Symptoms resolved after 2 months; however, central scarring persisted in the LE. Management with corneal crosslinking (CXL) in the RE to halt KC progression and avoid ACH was proposed. The patient was referred to the clinical immunology/allergy specialist to initiate a complete allergy workup and specific allergy tests.

KC is a progressive disorder of the cornea characterized by central thinning and asymmetrical steepening that induces irregular astigmatism.¹ The prevalence of KC ranges from 7% to 35% in patients with allergic eye disease.² Family history of KC, atopy, and eye rubbing are risk factors for KC. ACH is a rare, potentially blinding complication of KC that results from a tear in Descemet's membrane with subsequent corneal stromal edema due to aqueous humor accumulation. ACH occurs in

approximately 2.6% to 2.8% of patients with KC, and eye rubbing is considered an important triggering factor.¹

The pathogenesis of KC is complex. Allergic inflammatory mediators produce a variable itching sensation that leads to chronic eye rubbing, damage to the corneal epithelium, and subsequent release of proinflammatory cytokines (ie, IL-6, TNF- α). Such mediators alter the structural proteins of the cornea, resulting in thinning and deformation, both hallmarks of KC.² Failing to halt disease progression with CXL during the early stages of the disease, and more importantly, failing to address symptomatology in order to stop eye rubbing, could eventually lead to ACH.

Although the initial diagnosis of AC in our patient was based on the symptoms and clinical examination, eye rubbing associated with a behavioral or cognitive disorder cannot be neglected. Because allergy, atopy, and eye rubbing are key modifiable risk factors that impact KC prognosis and treatment outcome, an adequate workup for specific allergies is crucial.¹ Previous evidence has shown an association between high serum and tear levels of IgE, allergen-specific tear IgE, and conjunctival provocation tests in AC and KC.¹

Allergists and immunologists must be aware of the potential complications related to atopic diseases. Obtaining a complete medical history of eye symptoms, mainly eye rubbing, is paramount. Patients with ocular symptoms such as itching, eye rubbing, and red eye in the presence of decreased visual acuity and photophobia must be referred to the ophthalmologist to dismiss potentially sight-threatening complications.

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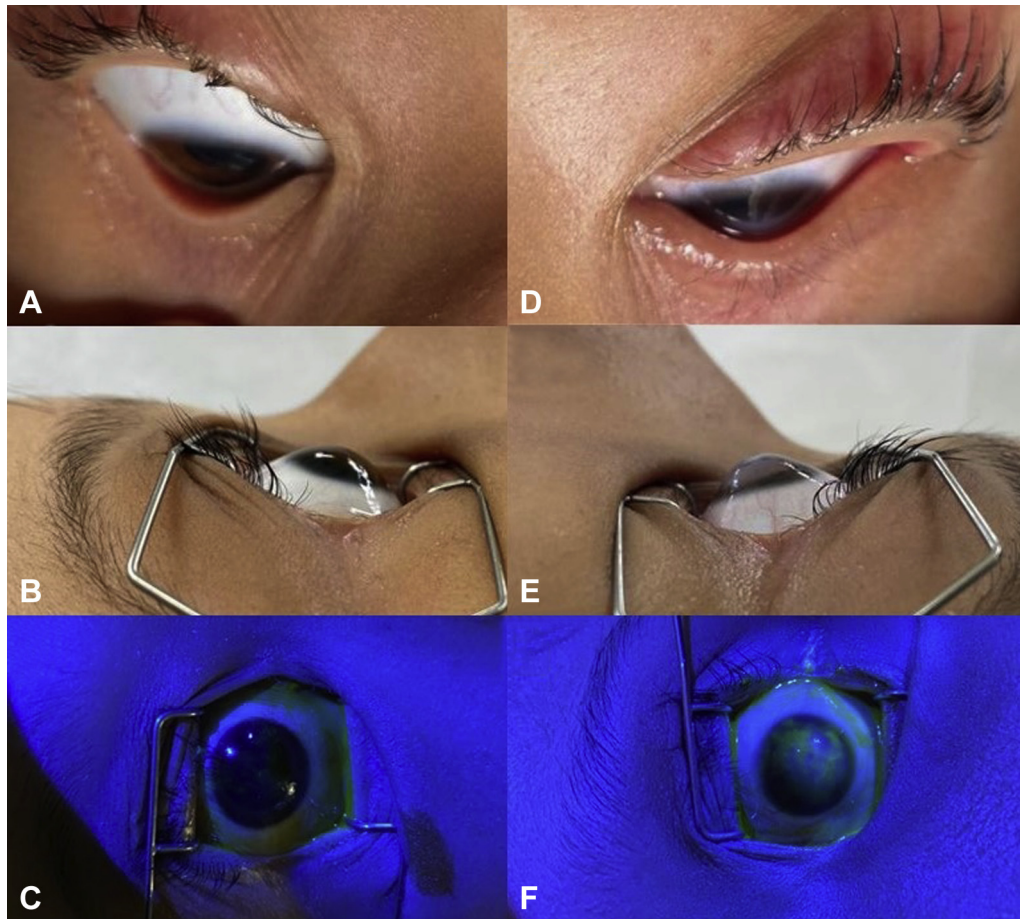


FIGURE 1. Clinical photographs of the patient in supine position of both eyes. **A-C**, Right eye. **A**, Mild Munson sign. **B**, Lateral view. Discrete central corneal bulging without opacification. **C**, No staining is observed. **D-F**, Left eye. **D**, Positive Munson sign. After upward traction of the upper eyelid, a V-shaped lower eyelid indentation is observed. **E**, Lateral view. Central corneal bulging and diffuse opacification secondary to stromal edema. **F**, Superficial punctate keratitis. Under cobalt blue light, corneal staining after applying fluorescein dye is observed on the left eye.