

## INTRODUCTION

Keratoconus is characterized by corneal thinning and ectasia resulting in high refractive errors, irregular astigmatism, and poor visual acuity in spectacles when compared to rigid contact lenses. The manifestation and progression of the disease is extremely variable between individuals and even between eyes of the same patient.<sup>1</sup> As keratoconic corneas become thinner and weaker, they are at risk for progression to a corneal hydrops. Additional risk factors in keratoconic patients have been identified for acute corneal hydrops.<sup>2</sup> Corneal hydrops events are characterized by severe corneal edema following a rupture in Descemet's membrane. Hydrops resolution can take several months and can result in severe scarring.<sup>3</sup> In severe cases, a corneal transplant may be warranted. It is uncommon, although possible, for hydrops to form a descemetocoele or perforate the cornea.

## CASE REPORT

A 46-year-old female with a 20-year history of keratoconus presented for urgent visit complaining of reduced vision, pain and cloudy cornea in the right eye. She admitted to sleeping in scleral lens one day prior and ever since her right eye has been irritated. She reported that upon waking that morning, she rubbed her eye and suddenly her vision became cloudy and felt like her eye was "running water". Her ocular history was positive for hydrops in the left eye one year prior (Figure 2 and 3). External examination revealed cloudy cornea in the right eye. Slit lamp examination revealed corneal hydrops with a descemetocoele formation (Figure 1). The patient was urgently referred to a corneal specialist for co-management and eventually has undergone corneal transplant in the right eye (Figure 4). Following a successful corneal transplant, the patient was refit in scleral contact lenses once cleared for contact lens wear by her corneal surgeon.

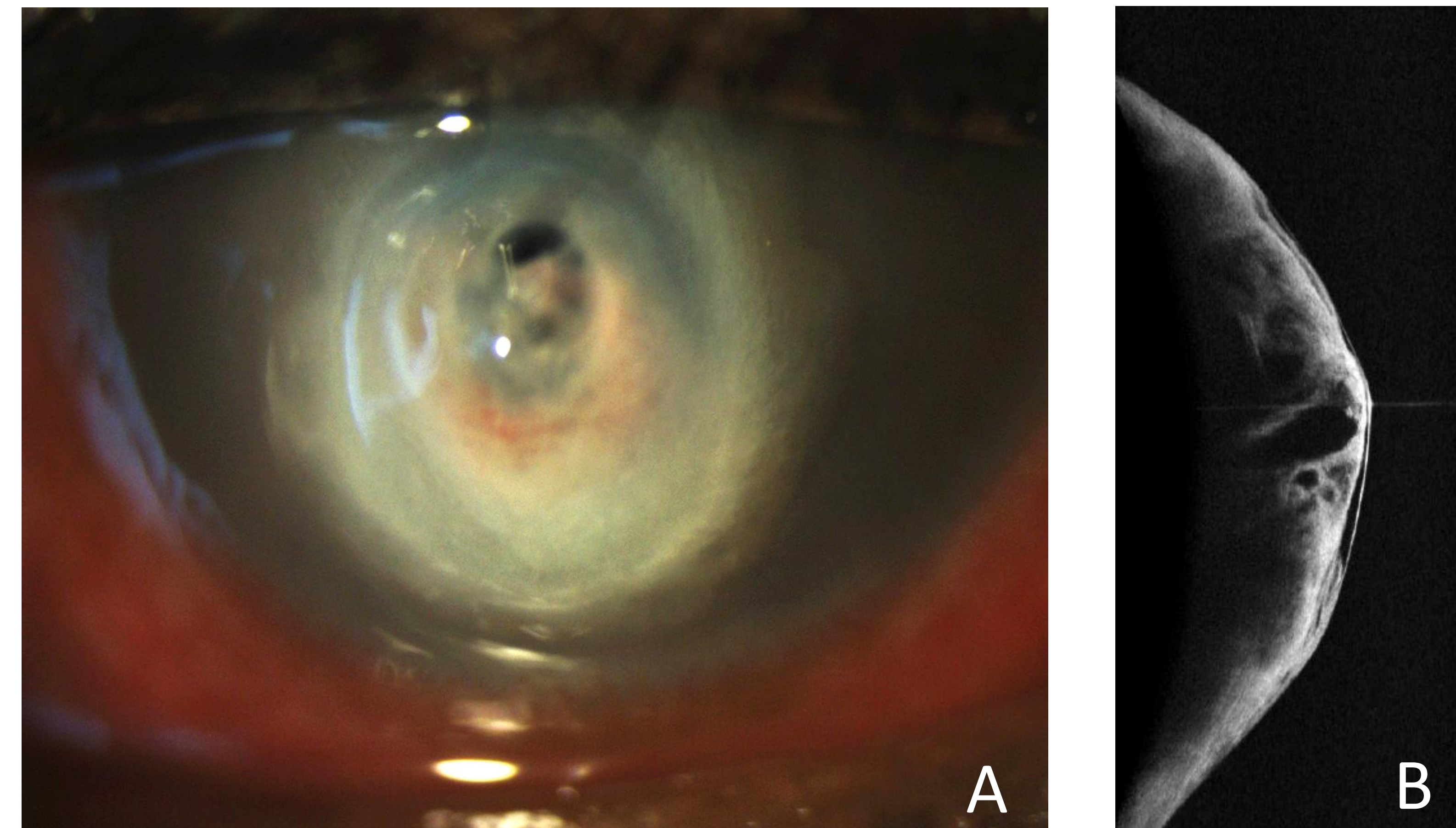


Figure 1: The patient's right eye (A) Corneal hydrops with Descemetocoele (B) Anterior Segment OCT

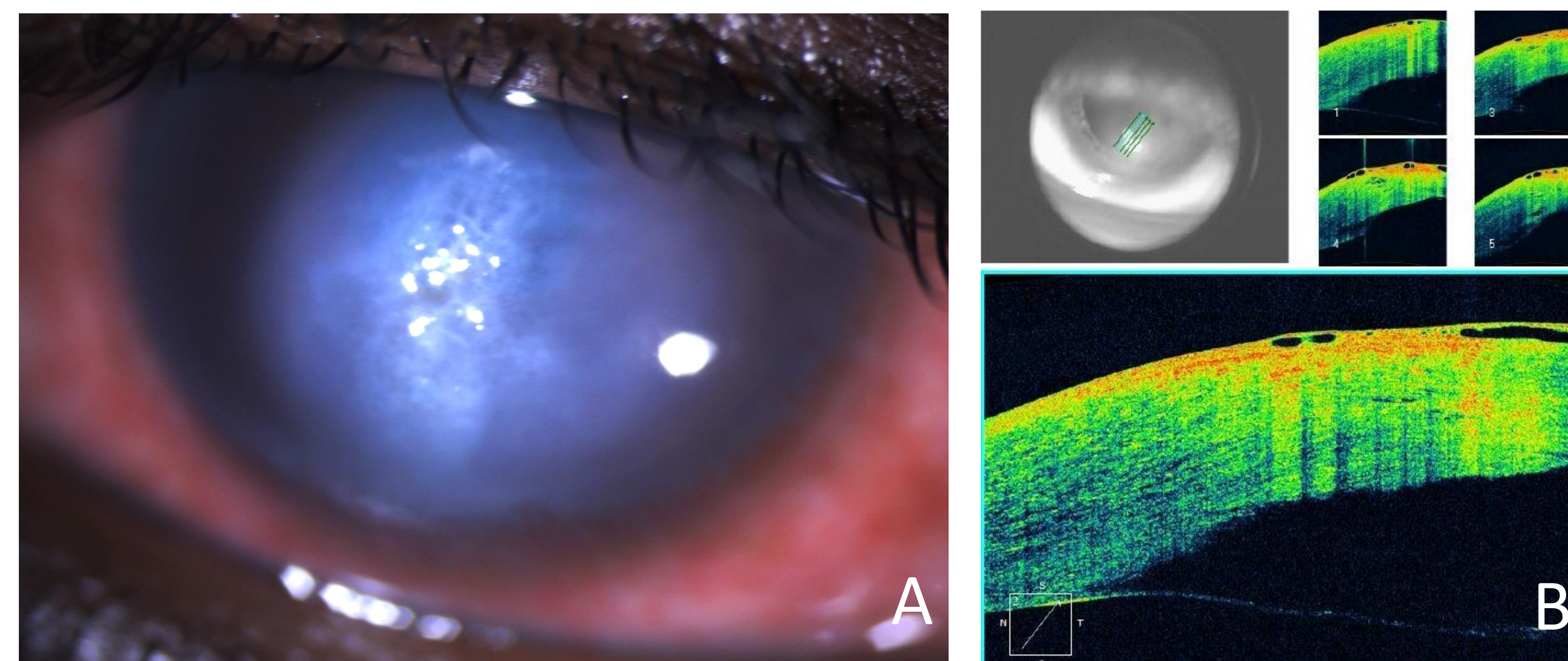


Figure 2: The patient's left eye one year prior (A) Acute corneal hydrops (B) Anterior Segment OCT.

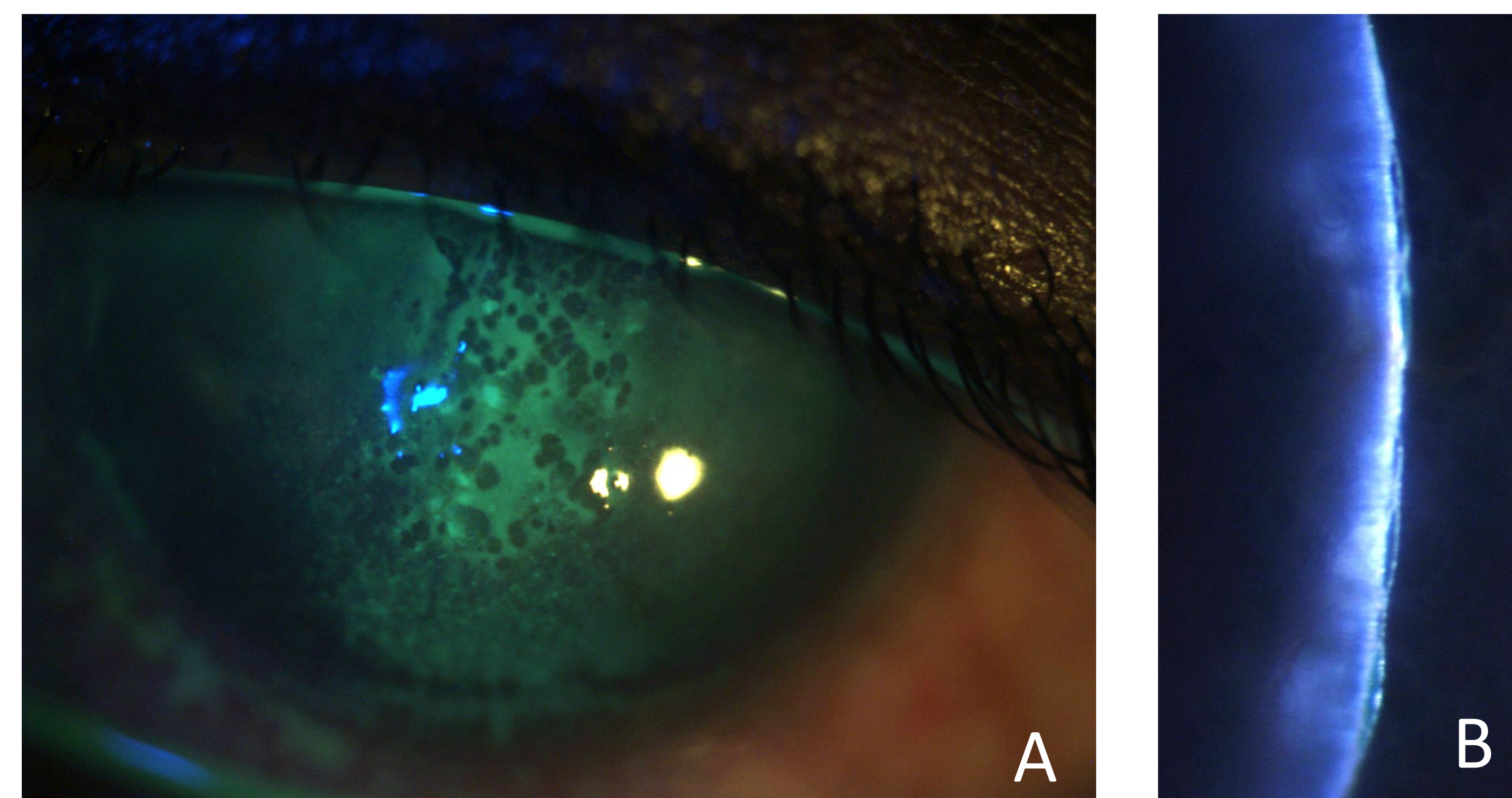


Figure 3 A-B: The patient's left eye one year prior during acute corneal hydrops showing bullae.

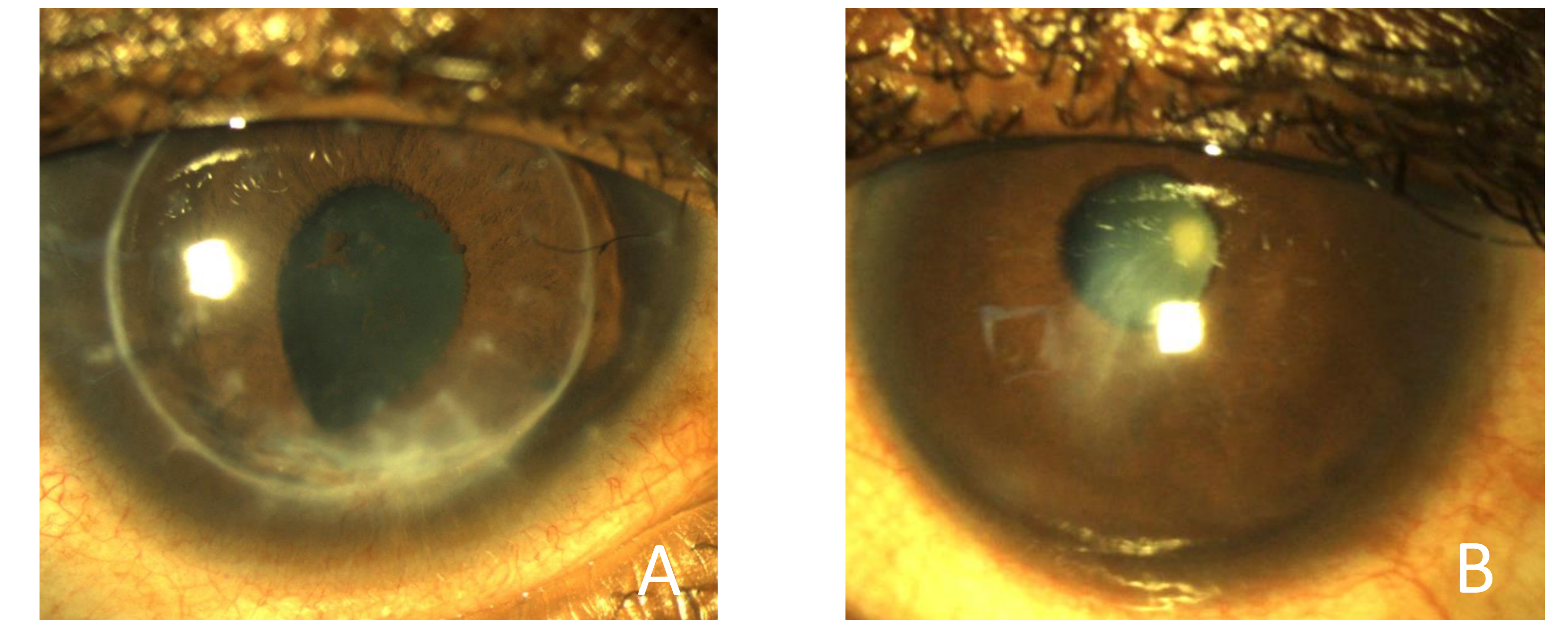


Figure 5: (A) Right eye post corneal transplant (B) Left eye showing residual scar in visual axis post hydrops resolution

## DISCUSSION

Although rare, corneal hydrops needs to be urgently seen and closely monitored until resolution. In very severe cases, where the intra stromal clefts are very anteriorly located and cornea is at risk for perforation, the patient should be co-managed with corneal specialist and may require a corneal transplant or other surgical intervention. Corneal hydrops will heal over the course of several months with the use hyperosmotic solutions and careful monitoring. Any keratoconic patient is at risk for the development of hydrops but potential risk factors include keratoconjunctivitis, atopic dermatitis, high keratometry, male gender, and eye rubbing<sup>3</sup>. Upon resolution and scar formation, patients may resume contact lens wear under close supervision. For patients with extensive scarring where contact lens cannot restore functional vision, corneal transplant is usually the next step. After clearance from corneal specialist, our patient was successfully refit into scleral contact lenses achieving BCVA of 20/25 OD and 20/50 OS. This patient is closely monitored every 3-4 months to ensure integrity of the corneal graft and compliance with scleral lens wear and care.

## CONCLUSION

This case demonstrates bilateral hydrops with two different outcomes. Patients who experience corneal hydrops should be extensively educated to not rub the eyes and to sleep with a fox shield. Any active perforation needs to be immediately co-managed with a corneal surgeon and patients must be made aware of the possibility of needing a corneal transplant.

## REFERENCES

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3. Bachmann BO, Matthaeh I, Schlereth S, Cursiefen C. Corneal Hydrops - Aetiology and Advanced Therapeutic Strategies. Klin Monbl Augenheilkd. 2023 Jun;240(6):795-802. English, German. doi: 10.1055/a-2048-6703. Epub 2023 May 5. PMID: 37146638.