

A Series of Unfortunate Events...: Increased Incidence of Acute Corneal Hydrops with Scleral Lens Wear.

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Introduction

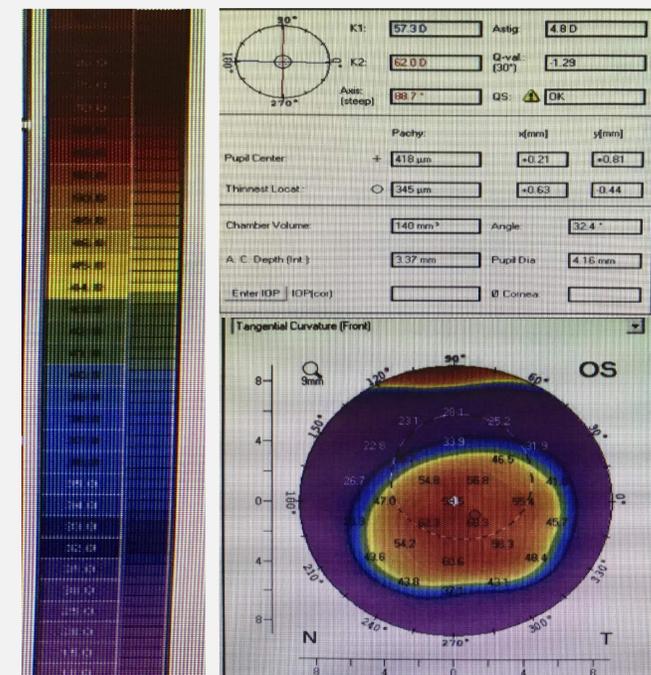
The advent and re-introduction of scleral lenses into the contact lens industry has made enormous strides over the past several decades. Sclerals have optimized both visual potential and comfort in individuals afflicted with a variety of corneal ailments.

This case study highlights three cases of acute corneal hydrops among patients with a history of habitual scleral lens wear. Each patient presented with a positive history of bilateral keratoconus with the presenting eye being classified as either advanced or severe. Their main form of vision correction was scleral lenses for over 3+ years, at minimum.

This homogenous presentation begs the question: *Does habitual scleral lens wear have the potential to increase metabolic demand of the corneal endothelium and push already primed patients over the edge?*

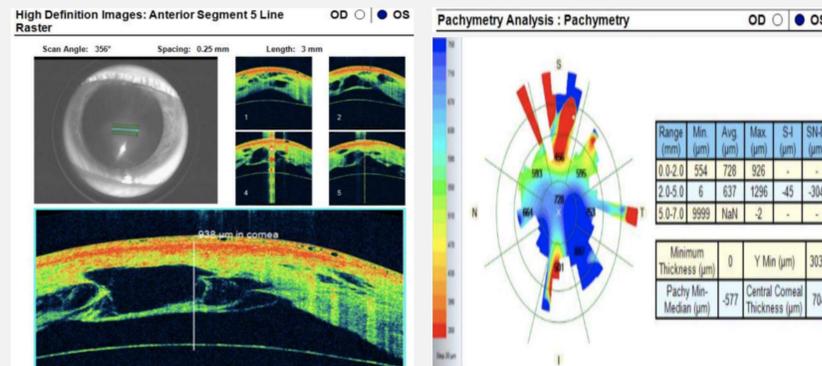
Case 1: Patient CL

44 year old female with bilateral, severe keratoconus. CL was optimally fit with scleral lenses 3 years ago. CL's BCVA with spectacles is 20/50 OD and 20/50 OS. With use of scleral lenses CL is able to achieve 20/25 OD and 20/20 OS. CL presented with acute corneal hydrops OS. CL was able to maintain her 20/20 acuity OS with use of a scleral lens post hydrops.



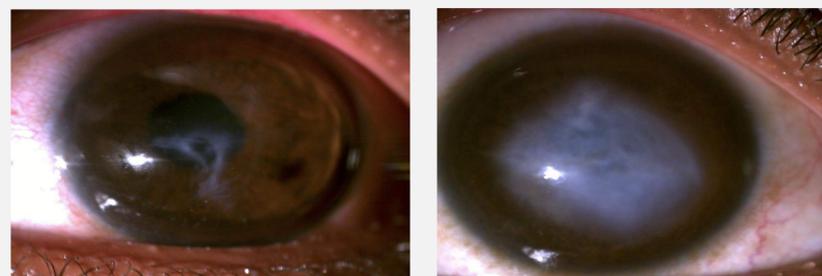
Case 2: Patient SM

37 year old female with bilateral, severe keratoconus. SM's best corrected vision in spectacles was 20/30 OD and 20/50 OS. With scleral lenses, vision improved to 20/20 OD/OS. SM presented with acute corneal hydrops OS. After healing, she was able to achieve 20/50 with a scleral lens OS.



Case 3: Patient DF

34 year old male with bilateral severe stage keratoconus. DF began using scleral lenses 5 years ago. With spectacle correction, DF is able to achieve 20/80OD and 20/100 OS. With scleral lenses, BCVA is 20/40 OD and 20/25 OS. DF presented to clinic 5 days ago with acute corneal hydrops OD. DF is currently HM @ 3 ft OD.

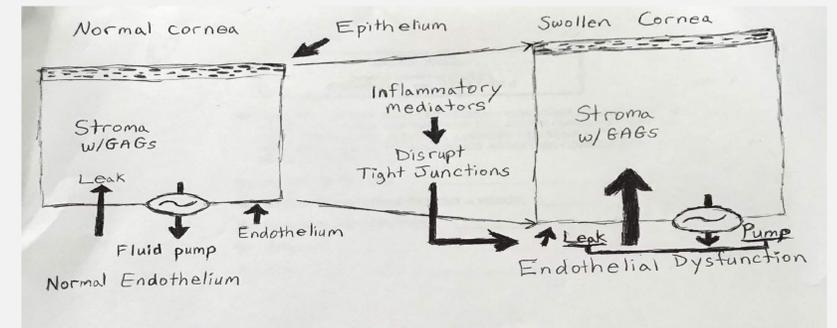


Discussion

Acute corneal hydrops is a complication of keratoconus and other corneal ectasias that is still incompletely understood. It is caused by a break in Descemet's membrane that results in marked corneal edema, and often leaves behind a vision impairing corneal scar. The condition is typically self-limiting over the course of several months but can result in a patient requiring corneal transplantation..

The corneal epithelium is a highly mitotic tissue that requires extreme amounts of aerobic energy from the atmosphere. When

these demands are not met, which is often with contact lens wear, stromal edema can result. Stromal edema increases stress on Descemet's membrane both metabolically as it seeks to maintain its usual deturgescence, and mechanically as this thin monolayer does not contain the same inherent elastic characteristics as the stroma. In an already vulnerable cornea, this increased chronic stress from habitual and even prolonged scleral lens wear, has the potential to lead to increased incidence of corneal hydrops "by reverse": The stromal edema is part of the inciting stimulus rather than simply a result of the traditional break in Descemet's caused by progressive stromal thinning/protrusion.



Conclusion

Overall, more research is needed in this area to determine whether there is truly a link between increased incidence of acute corneal hydrops in advanced to severe stage keratoconus, and subclinical corneal edema that can result from prolonged scleral contact lens wear.

References

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