

# Soft Contact Lens Scleral Piggyback to Reduce Fogging

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## Introduction

Scleral lens fogging, or buildup of debris in the tear film, is a common side effect experienced with scleral lens use. For scleral lens wearers who experience fogging, the buildup can cause clouding of vision that requires removal and rinsing of the lens, followed by reinsertion with fresh saline solution. This becomes a burden to patients and can lead to lens wear dropout. Though several theories exist around the origin of fogging debris and techniques to decrease fogging, there is no definitive treatment proven to solve the problem of fogging.

## Case Presentation

A 28-year-old male with keratoconus presented to the clinic having worn scleral lenses for a year previously. The patient reported visually significant fogging, requiring him to remove, rinse, and reinsert the lenses every two hours during the day. VAs were 20/60 OD and 20/50 OS with his current lenses. The patient was wearing 17.8 mm diameter scleral lenses with a central clearance of 150  $\mu\text{m}$  OU, and debris was present in the post lens tear reservoir.

## Methods

The patient was refit into new scleral lenses, a 15.8 scleral lens with toric haptics OU. The final central clearance was 230 microns OD and 140 microns OS with VA 20/30 OD and 20/25 OS. He began cyclosporine A topical drops twice a day to address dry eye and attempt to decrease the amount of fogging. At his next annual exam, the patient reported that he was removing lenses every hour to clean them and reinsert them due to continued fogging. A somofilcon A daily disposable contact lens was piggybacked under the scleral lens OU at this visit. The central clearance between the new scleral lenses and the soft contact lens was 180 microns OU. At follow up the patient reported decreased fogging. When he ran out of soft contact lenses, the fogging returned in equal volume. The patient has been wearing soft contact lenses underneath scleral lenses for two years. He reports rarely needing to remove his scleral lenses during the day to clean them due to fogging. He is happy with the vision and comfort of this piggyback system.

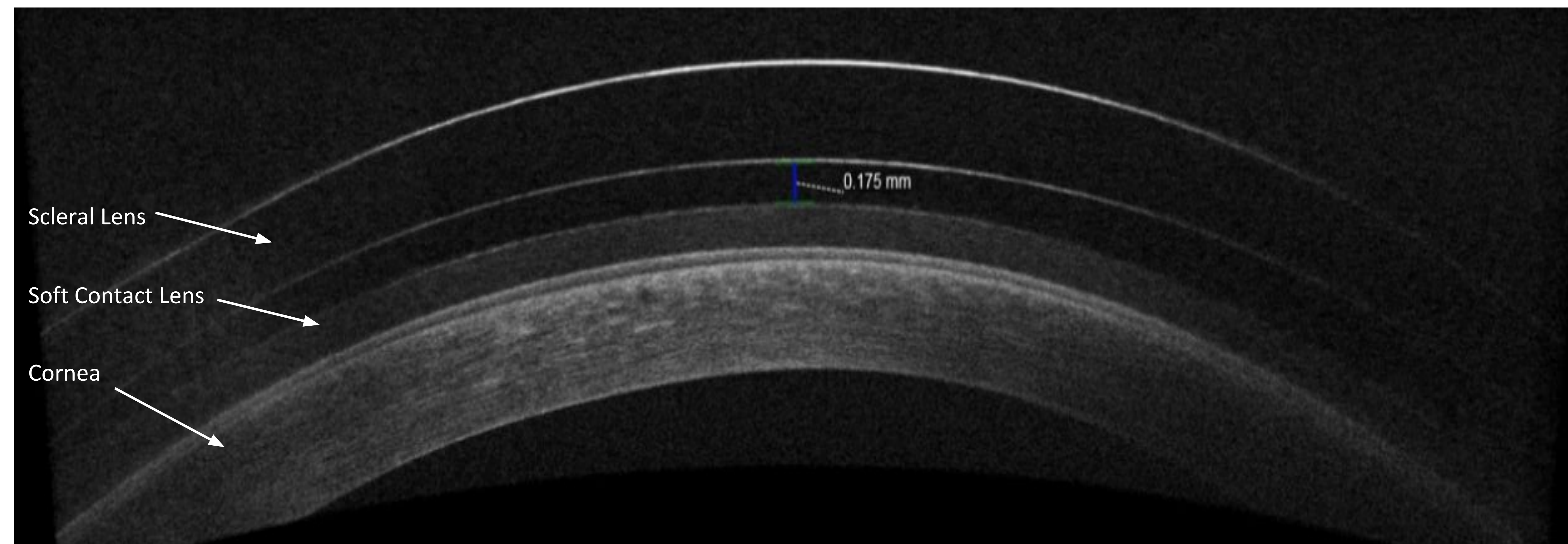


Figure 1. OCT cross sectional image of the scleral lens, post lens tear reservoir with central clearance of 175  $\mu\text{m}$ , soft contact lens, and cornea

## Conclusion

Material debris in a scleral lens tear reservoir is not only a nuisance, but a limiting factor in scleral lens wear for some patients who cannot achieve equivalent vision in other optical corrective devices. The burden of removing scleral lenses, the cost of extra saline, and reduced vision are reasons patients can drop out of scleral lens wear and seek less cumbersome options that may not provide the same visual clarity as a scleral lens. A soft contact lens piggybacked underneath of a scleral lens is a novel solution that reduced one patient's fogging and made it possible for him to continue to utilize this method of correction. The soft contact lens did not reduce the depth of the tear reservoir. It is possible that the soft contact lens added a seal, limiting tear exchange beneath the scleral lens. It is also possible that the presence of the soft contact lens altered the biochemistry of the post lens reservoir, reducing the production of debris.

## Limitations

A limitation of this study is the lack of definitive knowledge of what about the piggyback system eliminated the fogging for this patient. There are also potential health risks from adding another lens to the scleral lens oxygen transmission system; this patient has had no complications over the past two years.

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## Contact Information

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