

Use of Mini-Scleral Contact Lenses in Patients with High Hypermetropia

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BACKGROUND

Over the past few years, the use of scleral lenses to improve patients' quality of life has significantly increased in popularity. What was traditionally a lens reserved for cases involving complicated corneal pathology is now an excellent alternative for patients with severe dry eye disease or high corneal astigmatism.

Some research suggests that patients with high hypermetropia experience more higher order aberrations^{1,2}. This could be a factor for why high hypermetropes may not be able to achieve their desired visual acuity with the use of simple soft contact lenses, thus requiring specialized lenses. Rigid contact lenses have been shown to provide a regular refractive surface and decrease higher order aberrations.

The design of a high hypermetropic soft contact lens is also not user-friendly, as most of the weight is shifted centrally (figure 1). This increased difficulty of handling for the patient has negative effects on their satisfaction with its use. The below average curvature of the corneal surface also affects the fit of a standard lens³.

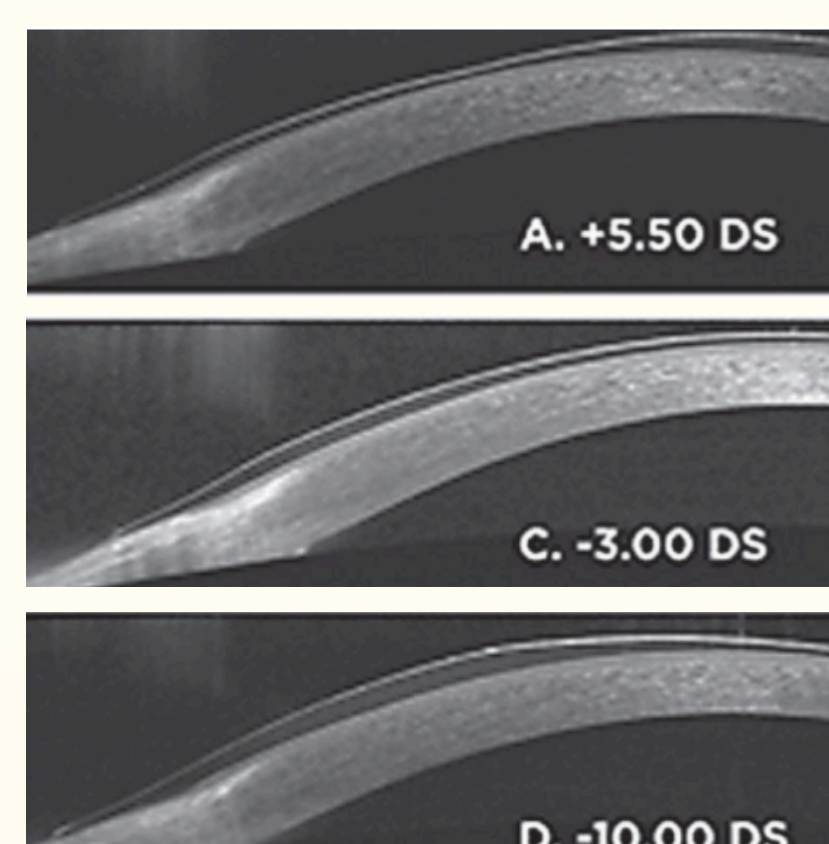


Figure 1: soft lens thickness profiles of various powers taken at the optic center. Center thickness for -3.00 D is 70 μ m.

An important factor to keep in mind when fitting mini-scleral lenses in these cases is the lens center thickness and vault. Due to the high hypermetropia, a thick lens or high vault can decrease oxygen transmission and thus a high Dk material and reasonable vault will need to be selected. Follow ups are essential following dispensing of the lenses to ensure corneal health and limit corneal hypoxia.

CASE HISTORY

A 27 year old white female presented to clinic with interest in being fit with monthly replacement soft contact lenses. Upon examination, her subjective refraction was OD: +9.00/-1.25x005, 20/25 and OS: +8.00/-1.25x177, 20/20 and soft lenses (Biofinity Toric XR, CooperVision) were ordered. At the fitting appointment, despite the soft lens fitting perfectly with no rotation, her vision was 20/50 OD and 20/30 OS with a significant over-refraction that only achieved 20/30 OU. Due to the weighting of the soft lens, the patient also struggled with lens handling, insertion, and removal.

LENS FITTING AND FINDINGS

She was then fit with a Onefit mini-scleral lens (Blanchard) based on 0.3 mm flatter than flat K. After settling for 30 minutes, she achieved 20/20 OU with the over-refraction. The patient was immediately more satisfied with the visual result from mini-sclerals compared to the soft contact lenses or even her glasses. New spherical lenses with center thicknesses of 0.49 mm OD and 0.44 mm OS were ordered.

Final lens order:

OD) Base Curve: 8.10 | Power: +11.00 | 14.9 diameter | STP#1 PERIPH
VA: 20/25

OS) Base Curve: 8.00 | Power: +8.87 | 14.9 diameter | STP#1 PERIPH
VA: 20/25+1

Although the VAs were not as optimal as the initial fit, they were improved compared to the best corrected spectacle acuities.

Lens fit:

(See figure 2)

OD) 128 microns of clearance centrally, centered with good coverage
OS) 211 microns of clearance centrally, centered with good coverage
NO BLANCHING/IMPINGMENT OU

The patient is happy and able to wear them all waking hours. Insertion and removal training was completed successfully and she now wears them full time rather than her glasses.

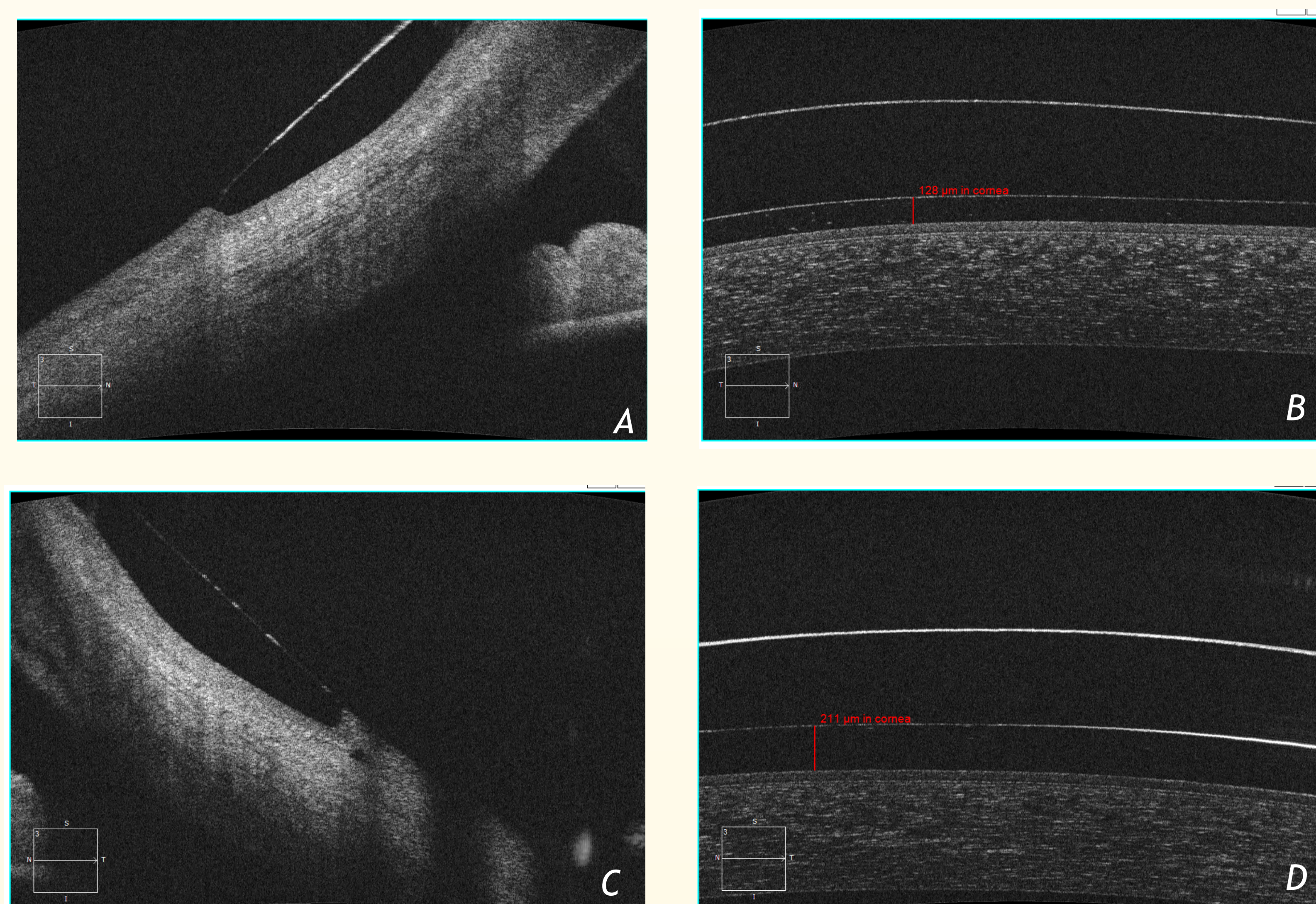


Figure 2: (A) right temporal scleral landing zone. (B) Right central clearance. (C) Left temporal scleral landing zone. (D) Left central clearance.

CONCLUSIONS

Optometrists can offer mini-sclerals as an alternative for high hypermetropes seeking better visual outcomes in a different lens modality. It is important to keep in mind the special considerations for high hypermetropes such as corneal hypoxia. Follow-up appointments with the patient will be key to ensure proper use of the lens as well as satisfaction with visual outcomes. This is yet another great application of the mini-scleral lens, expanding the opportunities for its use.

Another great option to try in the future would be rigid gas permeable lenses, as issues with hypoxia will be less of a concern. However, the trade-off of initial lens comfort may deter the patient.

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Contact and Disclosures

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