

Avoiding A Corneal Transplant in a Young Patient

William Skoog, OD, FAAO; Jennifer Harthan, OD, FAAO
Illinois College of Optometry , Chicago, IL

BACKGROUND

Corneal opacity is the fifth leading cause of blindness worldwide¹. A common cause of corneal opacity is infectious keratitis. In developed countries contact lenses are the leading cause of infectious keratitis while in developing countries it is from corneal trauma during agriculture work¹. The most common organism responsible for microbial keratitis in contact lens wear is *Pseudomonas aeruginosa*². When the visual axis is involved, a cornea transplant may be required to improve vision. Corneal transplants have a higher rate of rejection in younger patients³.

CASE DESCRIPTION

- 19-year-old Hispanic female presented for a gas permeable contact lens fitting
- History of decreased vision OS following microbial keratitis caused by *Pseudomonas* following extended wear of an unknown monthly soft contact lens.
- Entering visual acuities were 20/20 OD with correction and 20/200 OS without correction which improved to 20/40 with pinhole.
- Entrance testing: unremarkable
- Slit lamp examination: 6 mm round central stromal scar with significant stromal thinning OS (Figure 1).
- Simulated keratometry measurements: 40.75/43.0 @ 89 OD (Figure 2), 33.75/35.50 @ 99 OS (Figure 3).
- Manifest Refraction: -7.00-1.50x170 OD with a distance acuity of 20/20 and +2.00 sphere OS with a distance acuity of 20/80.
- Diagnostic lens fitting OS (Table 1A): Showed excessive central fluid reservoir clearance (Figure 4A). VA improved to 20/30 with an over-refraction.
- Final lens order OS (Table 1B): Oblate design to reduce central fluid reservoir clearance (Figure 4B).
- The patient was given specific instructions on proper wearing schedule and cleaning regimen. The patient was followed closely over the first three months of scleral lens wear to ensure appropriate wear.

FIGURE 1

Slit lamp photo showing a 6mm round central stromal scar OS secondary to microbial keratitis.

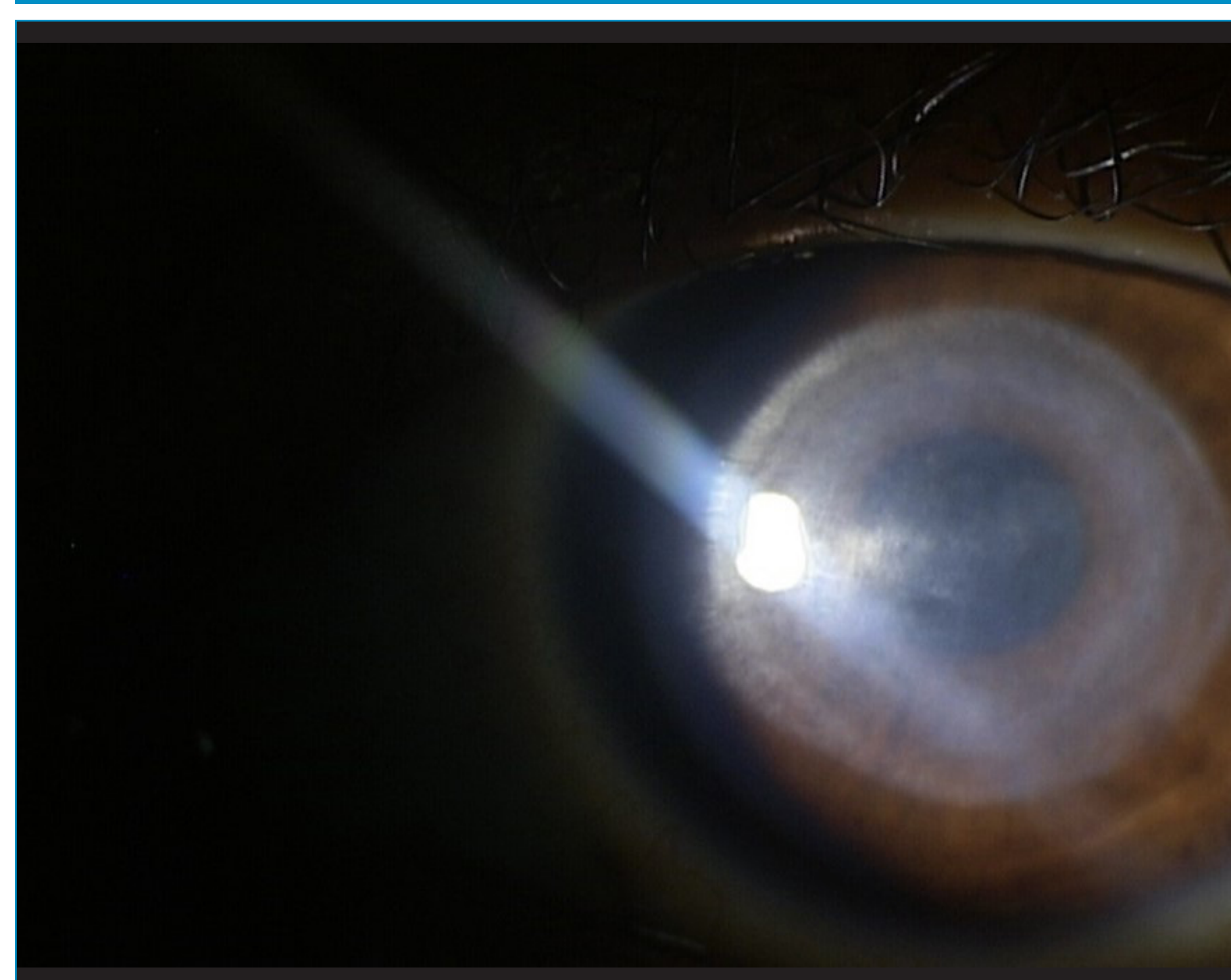


FIGURE 2

Axial map showing with-the-rule astigmatism in the right eye.

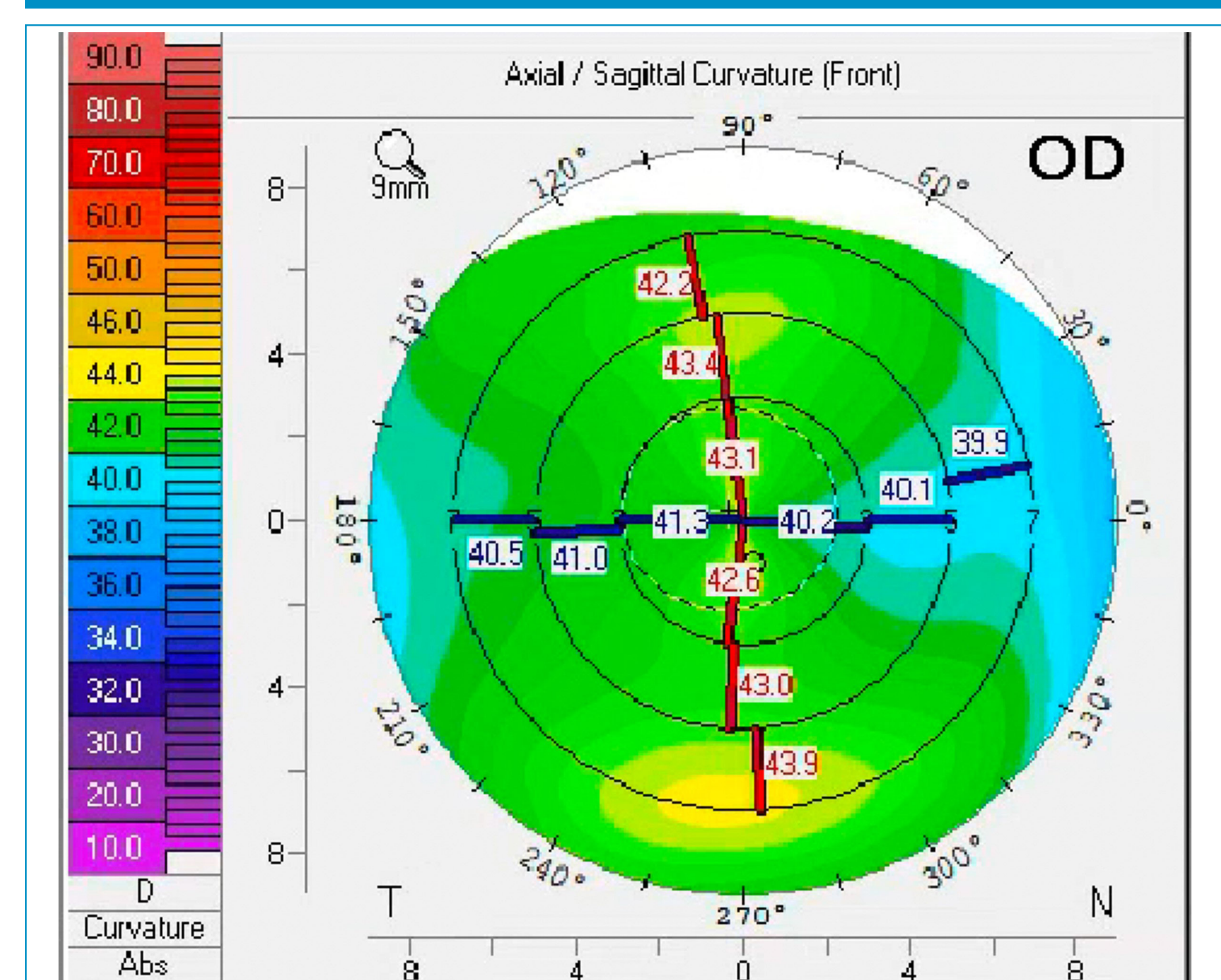


FIGURE 3

Axial map showing central corneal flattening secondary to microbial keratitis in the left eye.

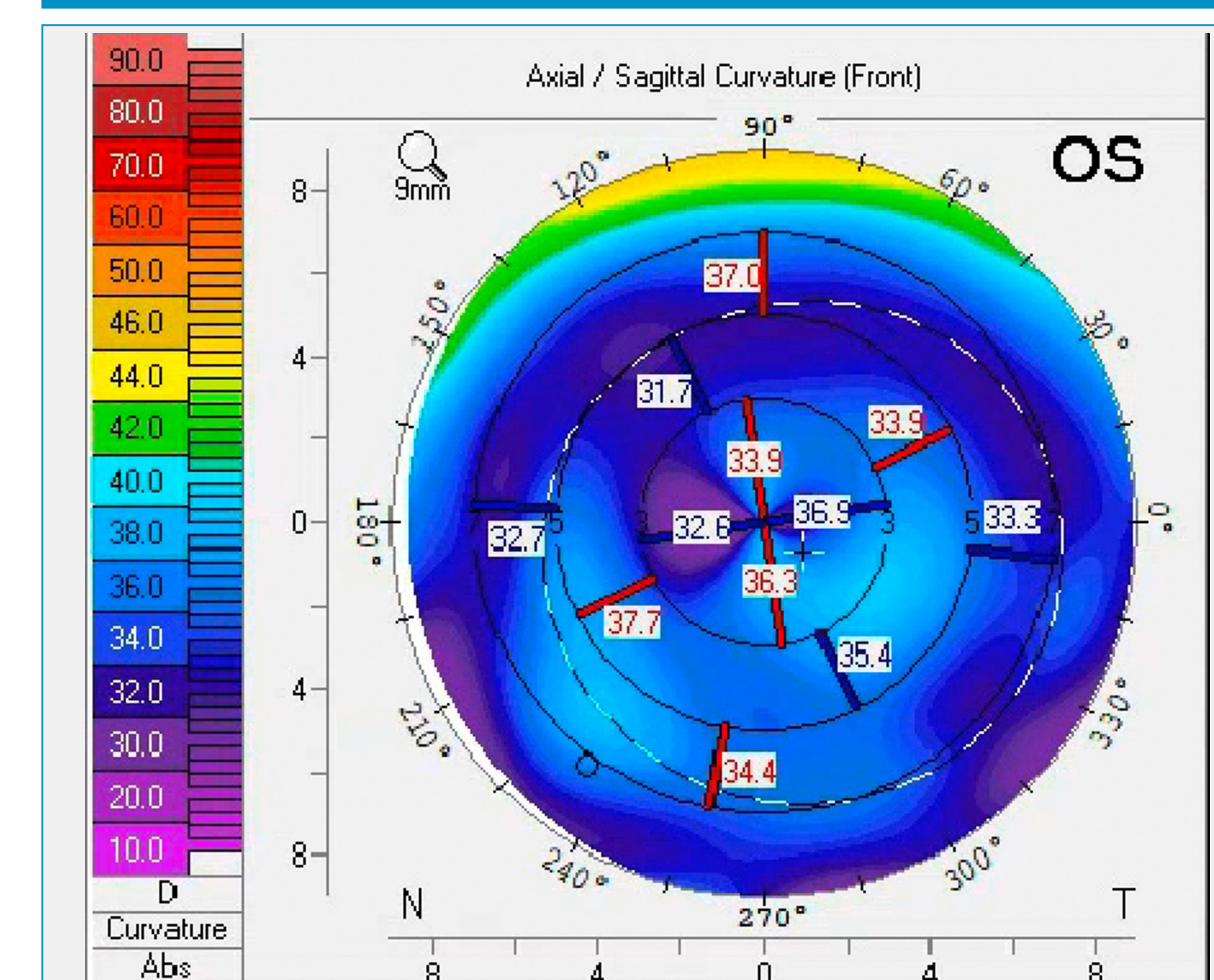


FIGURE 4A

An AS-OCT of a prolate diagnostic scleral lens OS showing excessive central vault with adequate midperipheral vault.

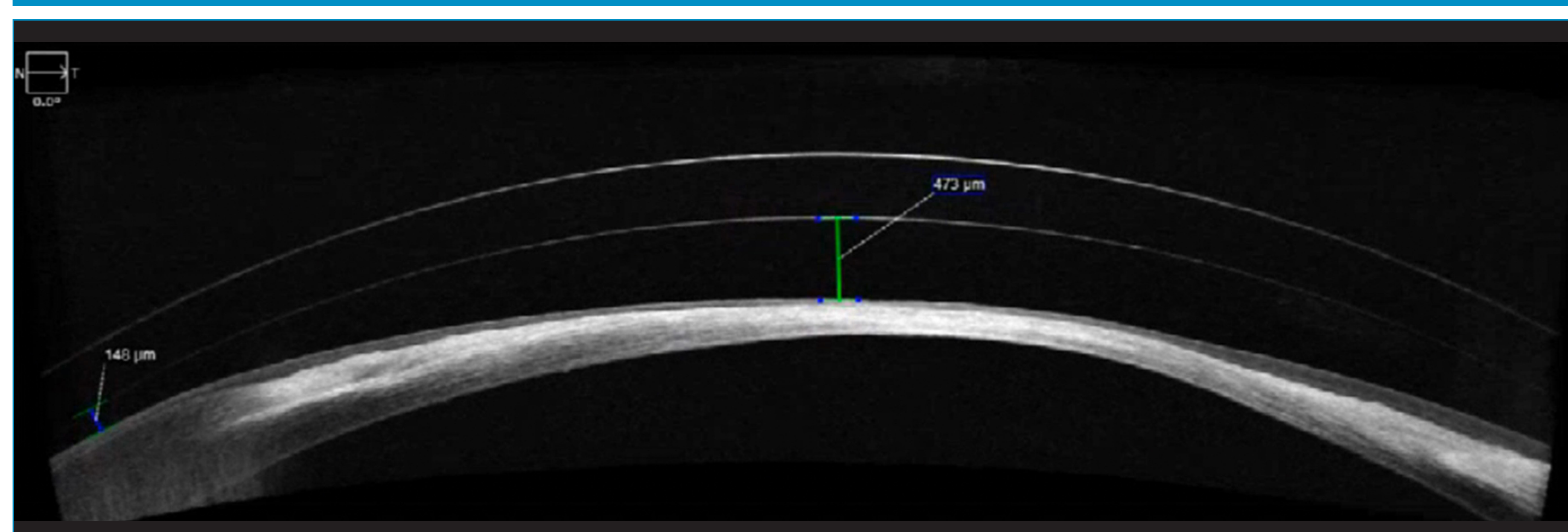


FIGURE 4B

An AS-OCT of an oblate scleral lens design OS showing adequate central clearance after ~6 hours of wear.



TABLE 1A

Initial diagnostic scleral lens OS that showed excessive central clearance

Type	Power	BC	Diameter	Edge	Design	Material
Onefit 2.0	plano	8.4	14.9	std	Prolate	Optimum Extreme

TABLE 1B

Final scleral lens design OS

Type	Power	BC	Diameter	Edge	Design	Material
Onefit 2.0	+6.50	8.4	14.9	std	Oblate – CCR 230	Optimum Extreme

CONCLUSIONS

Corneal scarring after microbial keratitis leads to vision loss secondary to corneal opacity and irregular astigmatism⁴. The two most common options to improve vision in these cases are corneal transplantation or a specialty contact lens. Corneal gas permeable or scleral contact lenses should be considered if they are able to provide the patient with functional vision as was demonstrated in this case.

REFERENCES

- Ting, D.S.J., Ho, C.S., Deshmukh, R. et al. Infectious keratitis: an update on epidemiology, causative microorganisms, risk factors, and antimicrobial resistance. *Eye* 35, 1084–1101 (2021). <https://doi.org/10.1038/s41433-020-01339-3>
- Tan, S., Walkden, A., Au, L. *et al.* Twelve-year analysis of microbial keratitis trends at a UK tertiary hospital. *Eye* 31, 1229–1236 (2017). <https://doi.org/10.1038/eye.2017.55>
- Gulias-Cañizo R, Gonzalez-Salinas R, Hernandez-Zimbron LF, Hernandez-Quintela E, Sanchez-Huerta V. Indications and outcomes of pediatric keratoplasty in a tertiary eye care center: A retrospective review. *Medicine (Baltimore)*. 2017 Nov;96(45):e8587. doi: 10.1097/MD.0000000000008587. PMID: 29137083; PMCID: PMC5690776.
- Singh K, Jain D, Teli K. Rehabilitation of vision disabling corneal opacities: is there hope without corneal transplant? *Cont Lens Anterior Eye*. 2013 Apr;36(2):74-9. doi: 10.1016/j.clae.2012.10.085. Epub 2012 Nov 27. PMID: 23199902.

CONTACT INFORMATION

William Skoog, OD, FAAO
wskoog@ico.edu
www.ico.edu