



J. Bryan Ahlborn, OD
CPT, Medical Service Corps
United States Army
Primary Care Resident

Scleral Lens Use To Avoid A Second Corneal Transplant

Brooke Army Medical Center
Joint Base San Antonio, Texas

Christian K. Olson, OD, MBA, FAAO
LTC, Medical Service Corps
United States Army
Residency Director



Abstract/Background

A 36-year-old white male with a history of progressive keratoconus underwent deep anterior lamellar keratoplasty (DALK) in the right eye in 2005 and in the left eye in 2008. Post DALK surgery he had poor visual acuity and the graft began to developed progressive neovascularization and scarring. With years of poor vision and a degrading graft his surgeon is considering a second corneal transplant but first refers to optometry for a medical contact lens fit.

Initial Exam-Past Ocular History

CC-referral from ophthalmology for medical contact lens fit

POHx-Progressive KC OU, DALK OD 2005, DALK OS 2008, tried scleral lenses in the past but was unable to wear them due to discomfort and pain, currently in a soft toric CL and unhappy with VA, only wears the CL 50% of the time

PMHx-untreated high cholesterol

Meds/Allergies-Pred Forte OU every morning/NKDA

Clinical Exam Findings

OD 20/400	Entering VA	OS 20/200
	Lensometry	
-11.00-8.25*025 20/100		-11.00-6.25*138 20/60
11	Tonometry by NCT	14
	Keratometry	
45.75/55.25*111		44.50/49.25*064
	Current CL Parameters	
	Hydrasoft Toric BC 8.3 Diameter 15.0	
-9.00-6.75*026 20/80		-7.75-5.50*140 20/30
	Entrance Testing	
	PERRL (-)APD; EOMs SAFE; CVF: FTFC OD & OS	
	Manifest	
-11.50-10.75*025 20/60- 2		-10.75-6.50*162 20/40-2
Anterior Segment Evaluation-unremarkable except Cornea-Neovascularization and scarring 360 with central graft OU, paracentral haze over the graft due to leaking neovascular vessels in two quadrants of the graft in both eyes		

Posterior Segment Evaluation-Unremarkable

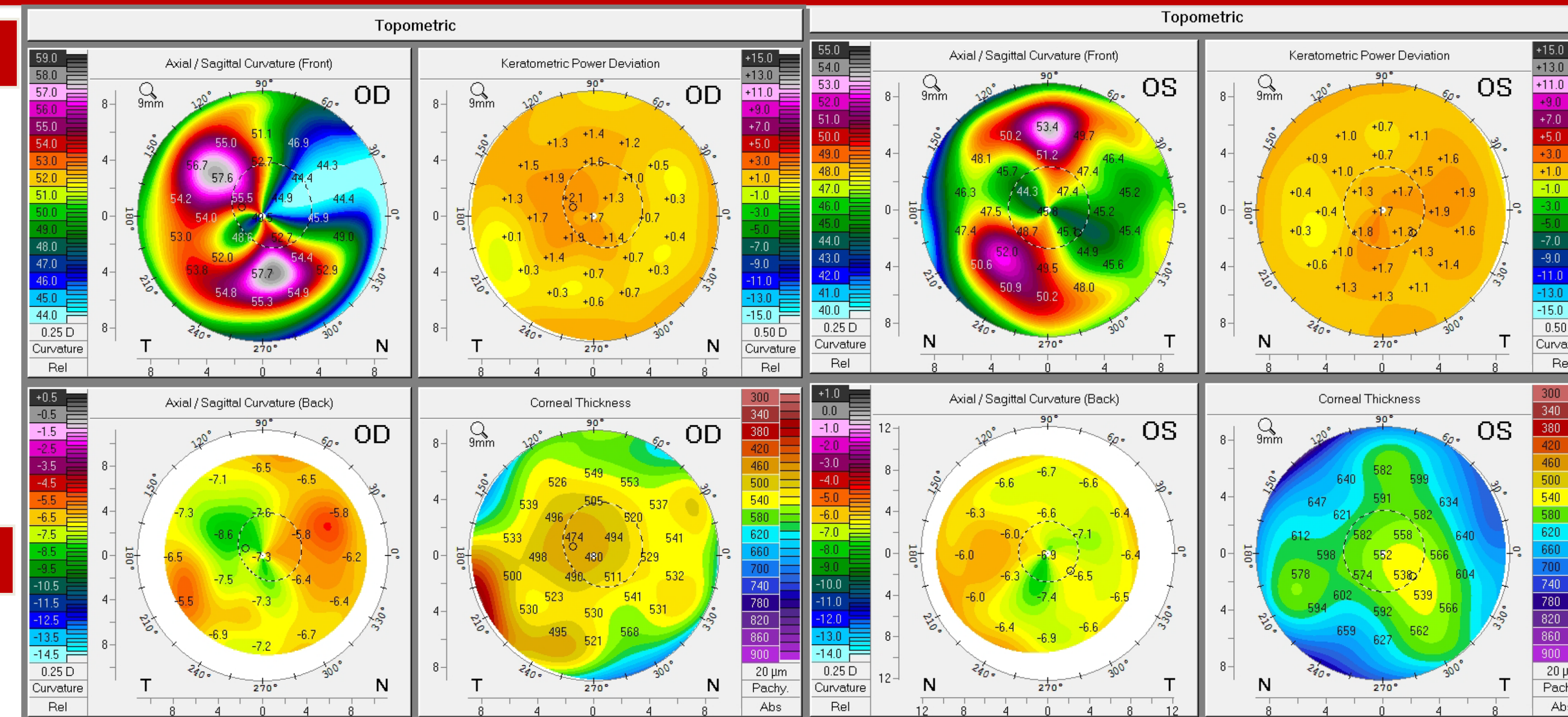


Figure 1. Corneal Topography OD and OS

Trial Lens Fitting

OD		OS
Z5/5.40/-2.00/16.0/6400	ZenLens Trials	4/5.10/-2.00/16.0/6700
680	Central Vault	596
-19.00 20/20-	Over Refraction	-17.50 20/25+
Limbal Vault Adequate OU, Peripheral Curve aligned OU,		
No compression, edge lift or impingement after 20 minutes of wear		
No lens awareness, good comfort		

Lens order; Zenlens Boston XO
OD -13.50/16.0/6.93/5050/STD PC/LC
OS -12.50/16.0/7.28/4750/STD PC/LC

After I/R training lens was dispensed, and an appointment was set for a three-hour challenge

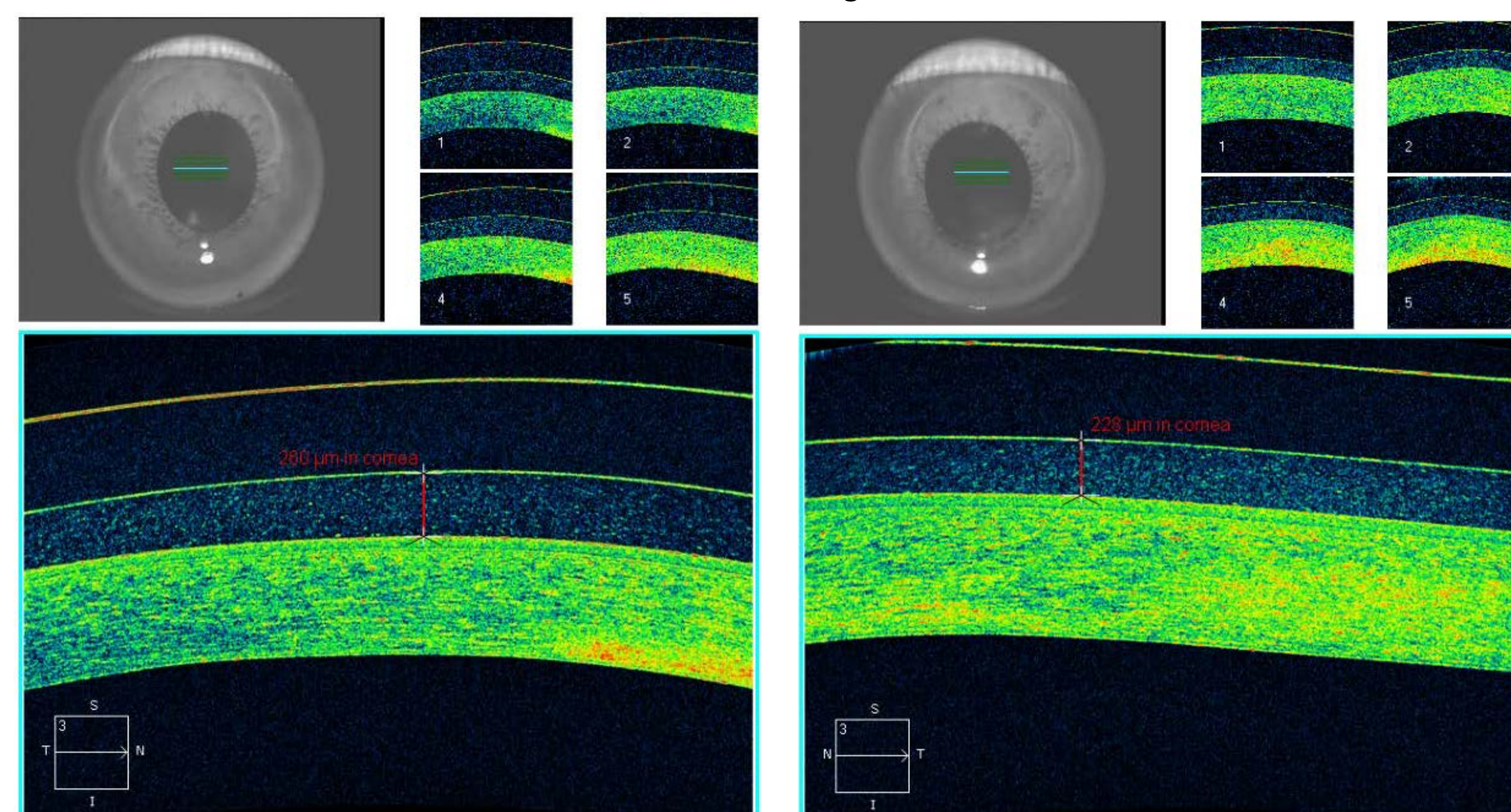


Figure 2. Anterior Segment OCT of the central vault OD and OS

Follow up and Final Fit

1st Follow up
CC blur after two hours, but “the best vision he has had since 2006”

Evaluation

OD/OS 20/20 central vault ~250um, superior and inferior edge lift, nasal and temporal compression

Flatten BC to reduce overall power and weight, add toric peripheral curve to improve fit

Lens order; Zenlens Boston XO Blue

OD -9.50/16.0/7.55/5050/Horizontal flat 2 and vertical steep 5
OS -8.50/16.0/7.97/4750/Horizontal flat 2 and vertical steep 5

2nd Follow up

Patient able to wear lenses for more than 8 hours a day, no blur, no irritation

Evaluation

OD 20/15 OS 20/20

Central Vault 260um OD and 228um OS

Limbal Vault adequate

Peripheral curve aligned

OR OD +0.50-0.50*077 20/15 OS +1.00-0.75*130 20/20

No fogging and no discomfort

Conclusion

Scleral lenses turned failing grafts and poor visual acuity into “the best vision since 2006” for this patient. Ophthalmology reports in a follow up visit; “Successful fit in scleral lens and loves his vision, no evidence of graft rejection at this time, doing well with excellent stable vision in new lenses.” He also has good comfort with this fit. Dispensed lenses with six month follow up.

Scleral lenses provide a means for graft patients to avoid or delay graft failure by providing a clear optical surface that vaults the irregularities of their graft and provides improved vision and ocular health.

References

1. Borderie VM, Touzeau O, Allouch C, Boutboul S, Laroche L. Predicted long-term outcome of corneal transplantation. *Ophthalmology*. 2009; 116: 2354-60.
2. Borderie VM, Sandali O, Bullet J, Gaujoux T, Touzeau O, Laroche L. Long-term results of deep anterior lamellar versus penetrating keratoplasty. *Ophthalmology*. 2012; 119: 249-55.
3. Boris S, Gehrman S, Frucht-Pery J, Solomon A. Scleral contact lenses for visual rehabilitation after penetrating keratoplasty: Long term outcomes. *Contact Lens and Anterior Eye*. 2014; 37:196-202.
4. Worp E, Bomman D, Ferreira DL, et al. Modern scleral contact lenses: A review. *Contact Lens Anterior Eye*. 2014; 37:240-250.