

LASERFIT Case Study:

LASIK over PKP for Keratoconus

I was diagnosed with Keratoconus in my right eye. My eye progressed quickly and I had to do a full thickness corneal transplant in 2000. The results was a clear cornea but with very high astigmatism that was not corrected with glasses...I did Lasik to correct the astigmatism, and the results were great at the beginning achieving 20/20 vision. However, one year after that Astigmatism started increasing again, and today I have more than 4 degrees of astigmatism that cannot be corrected with glasses, and it seems astigmatism is still changing. I can get only 10/20 with glasses and a horrible quality of vision. Recently, I tried XXXXXXXXXX from XXXXXXXXXXXX which can give me around around 20/25 on a good day, but still with a bad quality of images at night and with light burst/halo. I get acceptable quality of images during day time or under strong light. However, I am not able to wear it more than 4 hours, because is becomes foggy and it puts pressure on my eye as well.

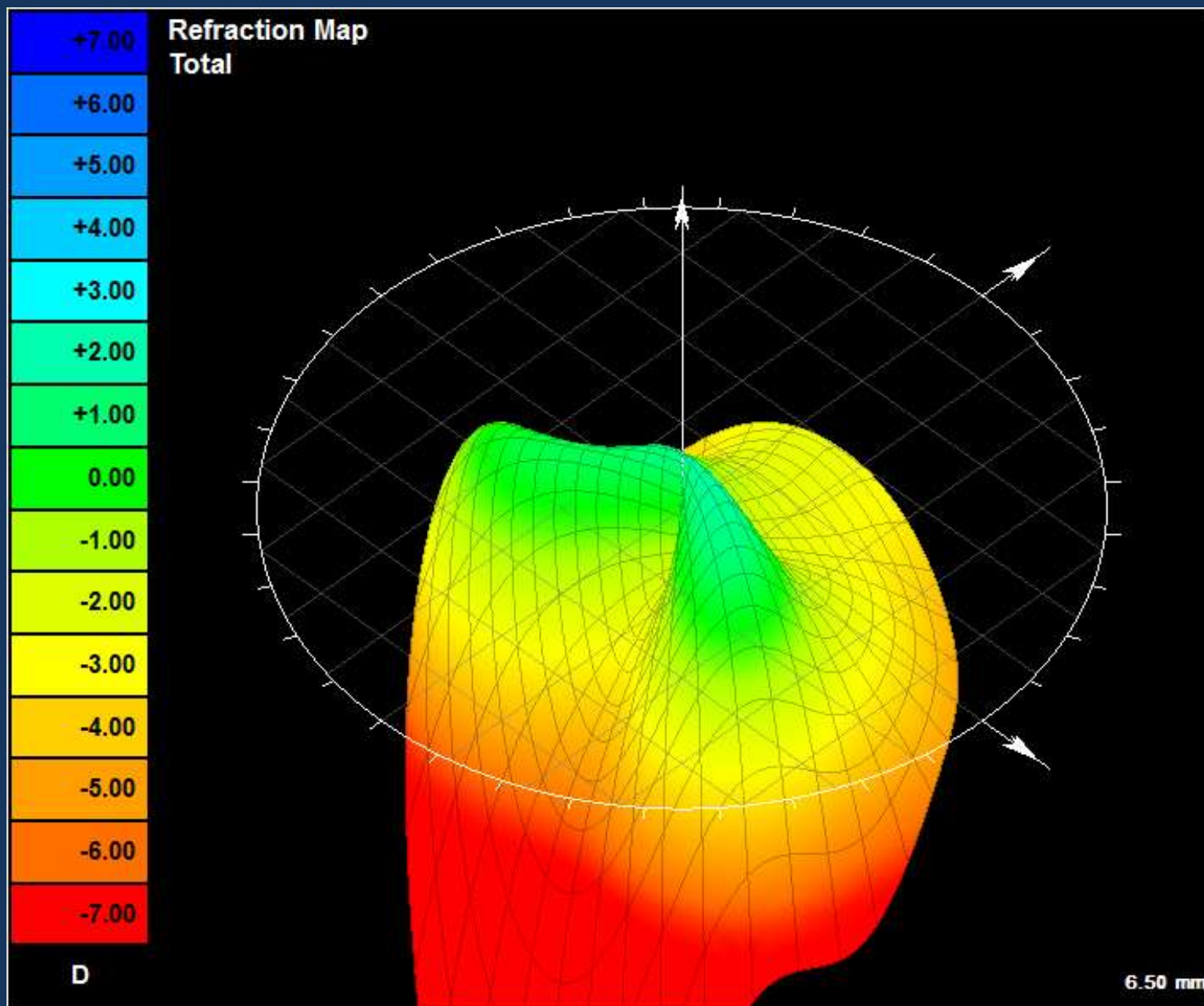
Unaided visual acuity = 20/200

Manifest refraction = +1.50 -3.25 x 180

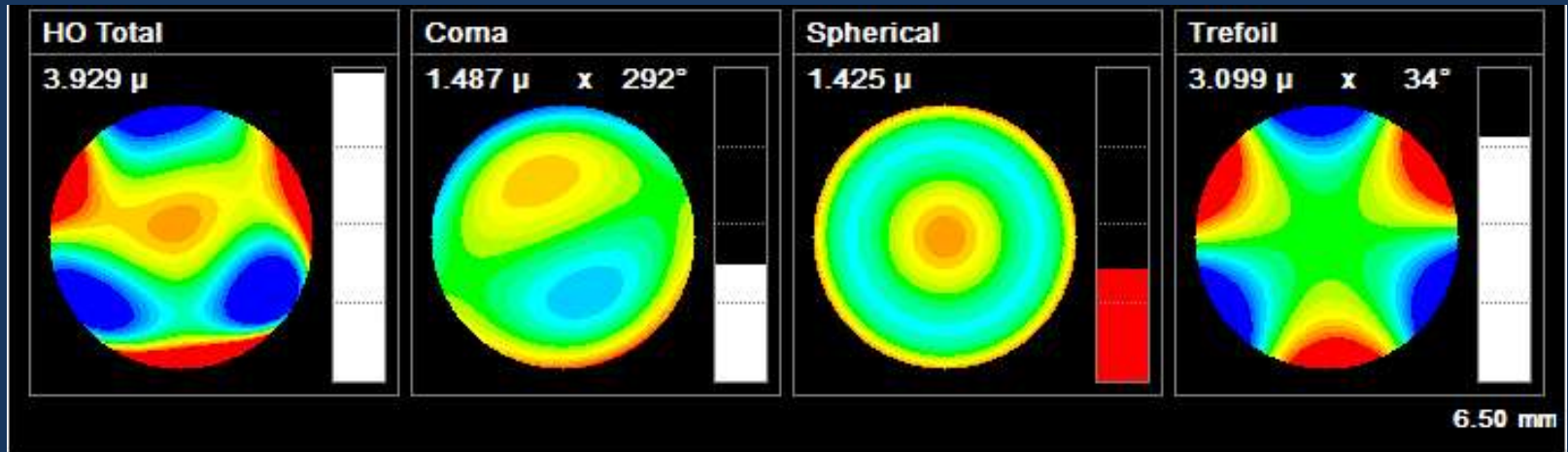
BVA = 20/50

Condition of graft = excellent

3D Refraction



Combined HOA unaided



Initial Laserfit lens

Keratometry = 8.51 x 7.44

Reference sphere = 8.13

Lens diameter = 18.0 mm

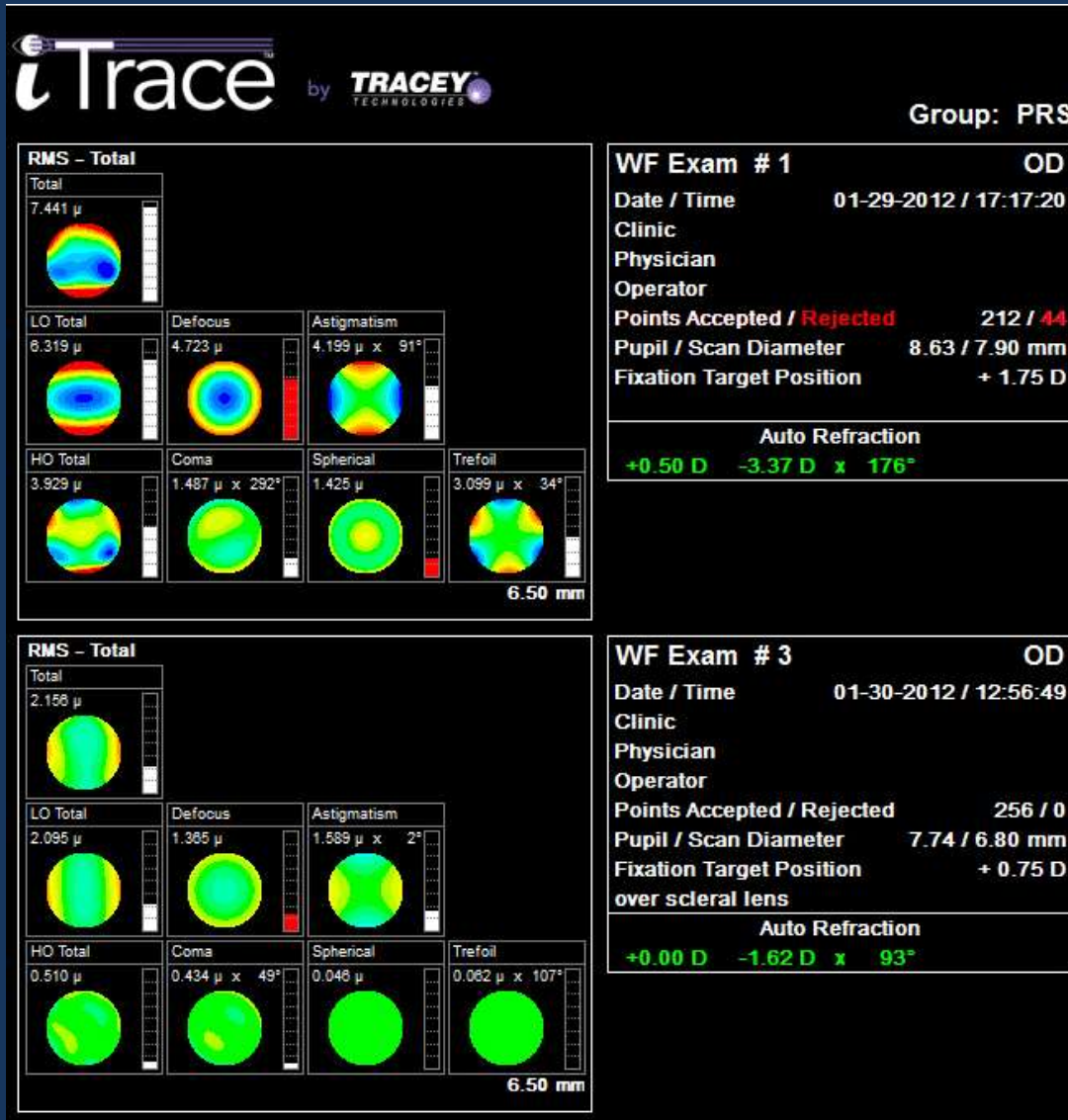
Optical Zone = 9.0 mm

Posterior base curve = 8.13

Power = plano

Over-refraction = -0.50 -1.50 x 100VA = 20/30-

Initial Laserfit Lens



Initial Laserfit lens

Aberrations*	Unaided	w/Biometric Lens	% Reduction
Total HO	3.929 μ	0.510 μ	87
Coma	1.487 μ	0.434 μ	71
Spherical	1.425 μ	0.046 μ	97
Trefoil	3.099 μ	0.062 μ	98

* Measured at 6.5 mm aperture

Second Laserfit lens: wavefront guided

Lens diameter = 18.0 mm

Optical Zone = 9.0 mm

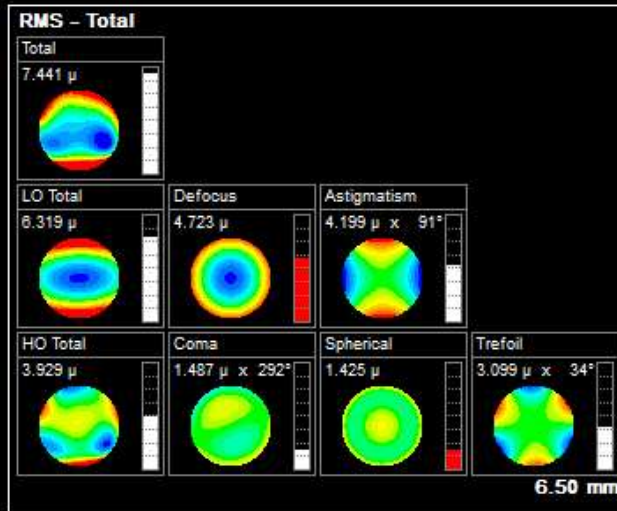
Wavefront guided optics

Over-refraction = +0.50 -0.50 x 155 VA 20/20-

Second Laserfit WG lens



Group: PRS



WF Exam # 1	OD
Date / Time	01-29-2012 / 17:17:20
Clinic	
Physician	
Operator	
Points Accepted / Rejected	212 / 44
Pupil / Scan Diameter	8.63 / 7.90 mm
Fixation Target Position	+ 1.75 D
Auto Refraction	
+0.50 D -3.37 D x 176°	



WF Exam # 4	OD
Date / Time	01-31-2012 / 14:21:04
Clinic	
Physician	
Operator	
Points Accepted / Rejected	256 / 0
Pupil / Scan Diameter	7.64 / 6.70 mm
Fixation Target Position	+ 1.50 D
over wavefront lens	
Auto Refraction	
+0.62 D -0.37 D x 133°	

Second Laserfit WG lens

with proprietary wavefront guided correction

Aberrations*	Unaided	w/LaserfitLens	% Reduction
Total HO	3.929 μ	0.313 μ	92
Coma	1.487 μ	0.239 μ	84
Spherical	1.425 μ	0.013 μ	99
Trefoil	3.099 μ	0.029 μ	99

* Measured at 6.5 mm aperture

Laserfit lens comparison

standard vs. wavefront guided



Laserfit lens comparison

standard vs. wavefront guided

Aberrations*	Standard	Wavefront	% Reduction
Total HO	0.510 μ	0.313 μ	39
Coma	0.434 μ	0.239 μ	45
Spherical	0.046 μ	0.013 μ	72
Trefoil	0.062 μ	0.029 μ	53

* Measured at 6.5 mm aperture

Summary

A patient with a LASIK procedure over a penetrating corneal transplant following keratoconus who has high with-the-rule corneal astigmatism and extremely elevated higher order aberrations, has experienced declining vision in recent years. Attempts to wear conventional contact lenses, including Clearkone lenses, were unsuccessful for various reasons. He presented for a Biometric scleral lens fitting. An initial lens resulted in a significant reduction in HOA, but created induced astigmatism against-the-rule. Another lens was created with wavefront optics to correct residual HOA and the induced astigmatism.

The patient was able to wear the second lens successfully all day. This lens resulted in a further reduction of the HOA by approximately 50% over the standard lens, and well over 90% improvement over the unaided condition.