Topography guided treatment for patients with irregular cornea using the Wavelight Alegretto platform

IC 392553 April 6th, session 06-303 rom 181A

ASCRS 2008 Chicago

A. John Kanellopoulos, MD

Clinical Associate Professor New York University Medical School

Director, Laservision.gr Institute, Athens, Greece

www.brilliantvision.com

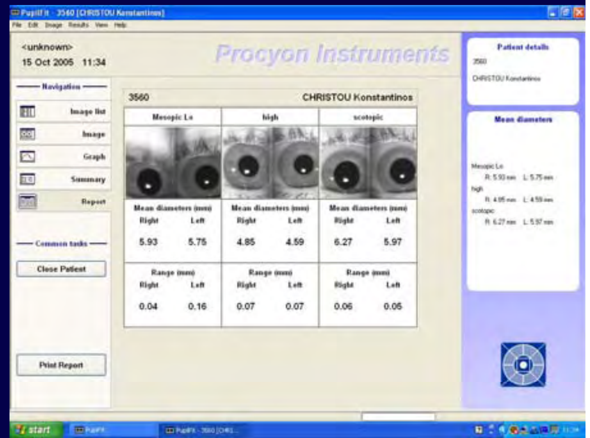
Financial Disclosure

I have the following financial interests or relationships to disclose:

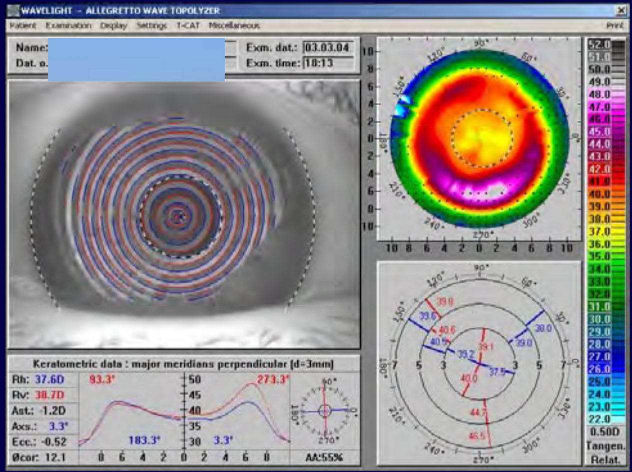
- Wavelight Technologies (Erlagen, GERMANY)-non paid consultant
- Priavision (USA)-non paid consultant

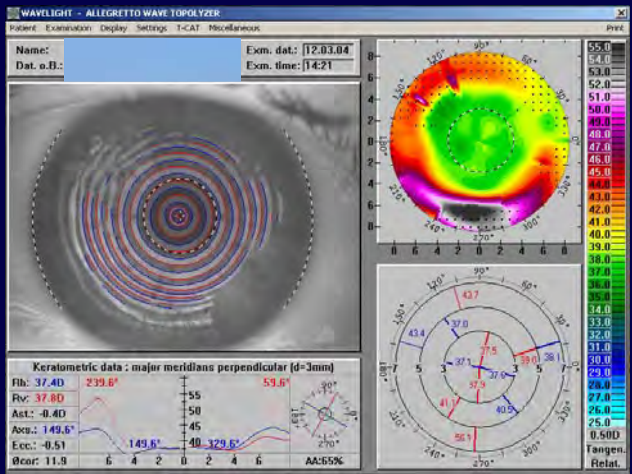
Define customised in 2007?

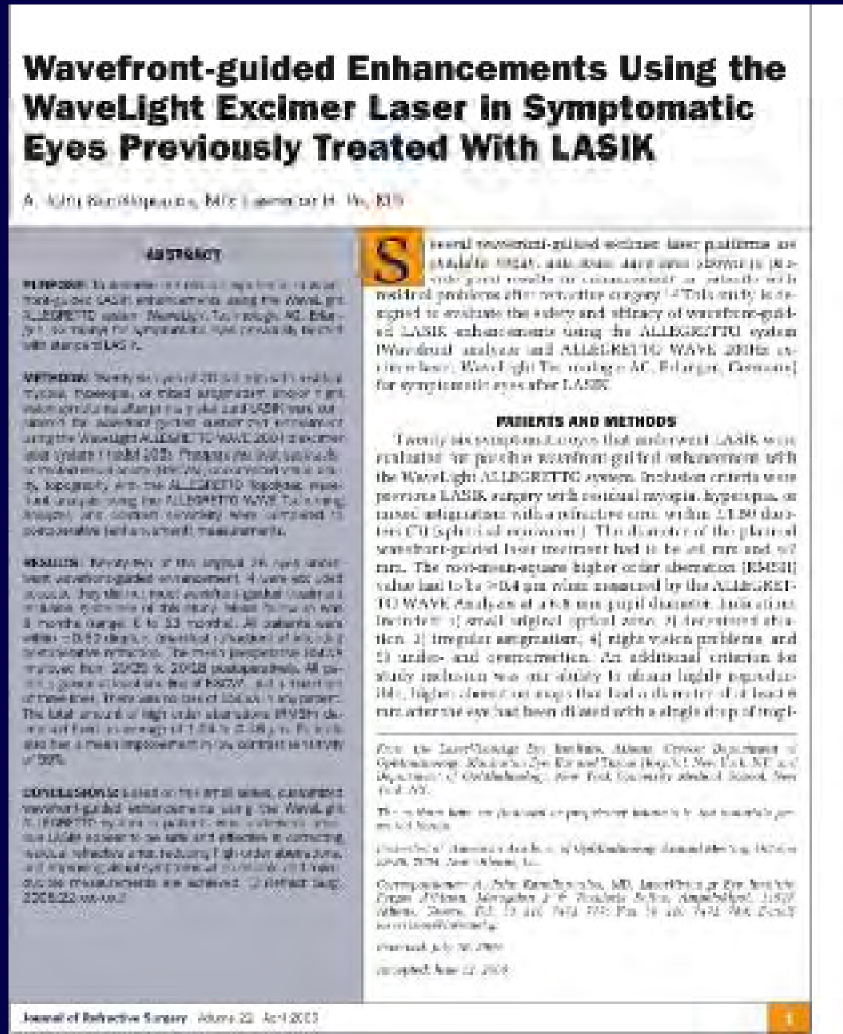
- Wavefront-optimised?
- Topography guided?
- Wavefront guided?
- Asphericity adjustment?
- Adjustment to pupil size?
- Adjustment to angle kappa?
- Customised flap (femtosecond lasers)?



Kanellopoulos et al, AAO 2004, JRS May 2006







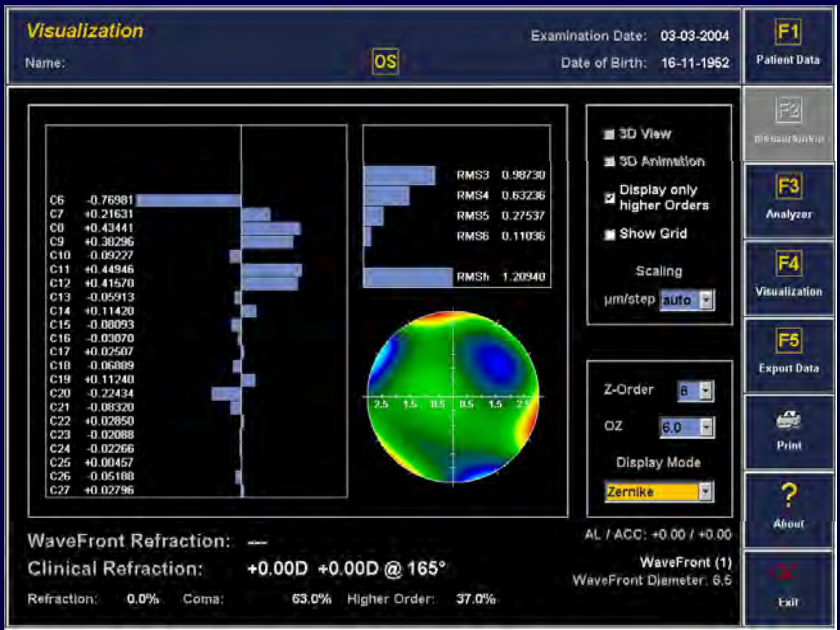
Wavefront-guided Enhancements Using the WaveLight Excimer Laser in Symptomatic Eyes Previously Treated With LASIK

ABSTRACT

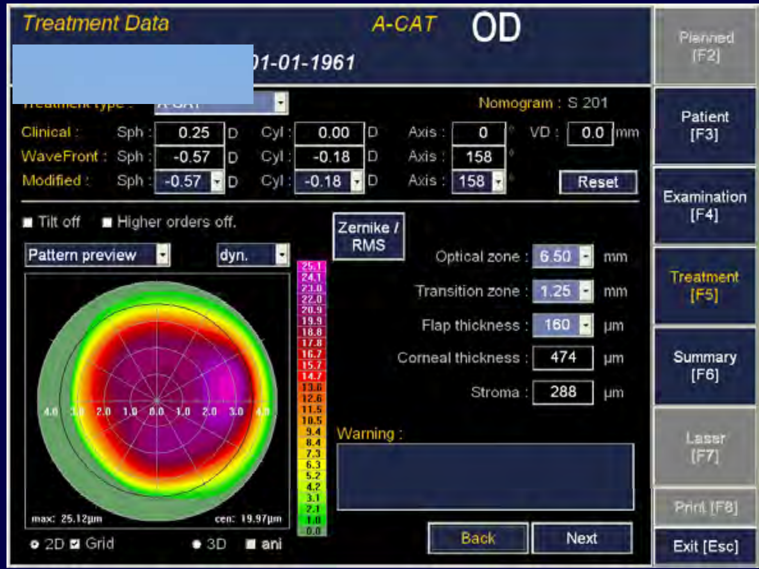
PATIENTS AND METHODS

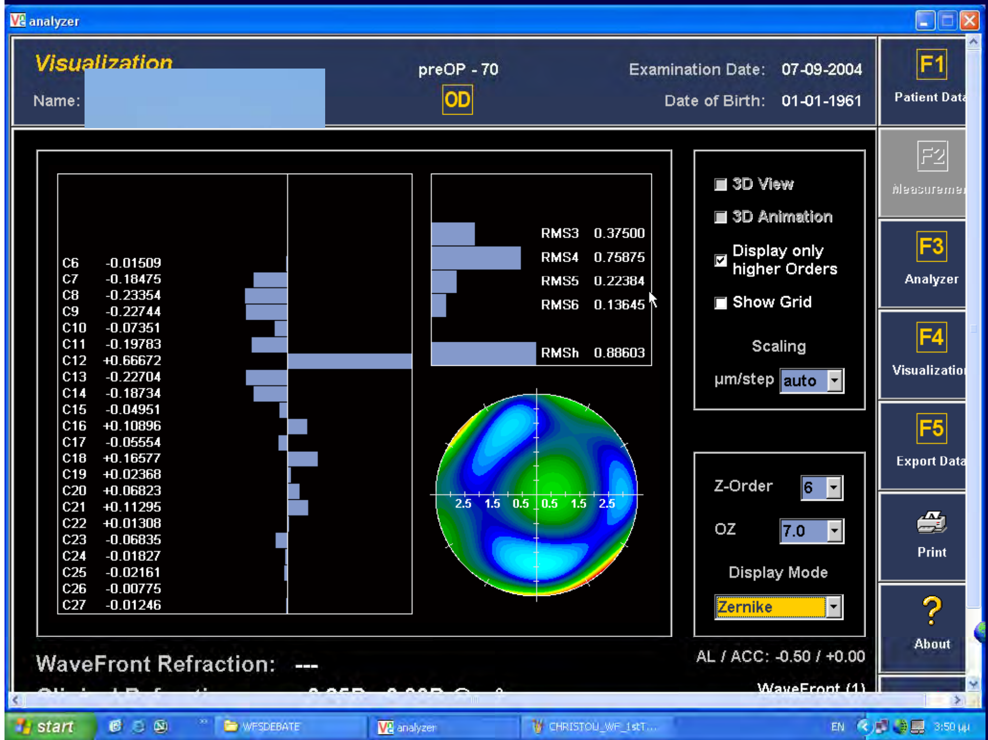
Kanellopoulos, MD   www.brilliantvision.com

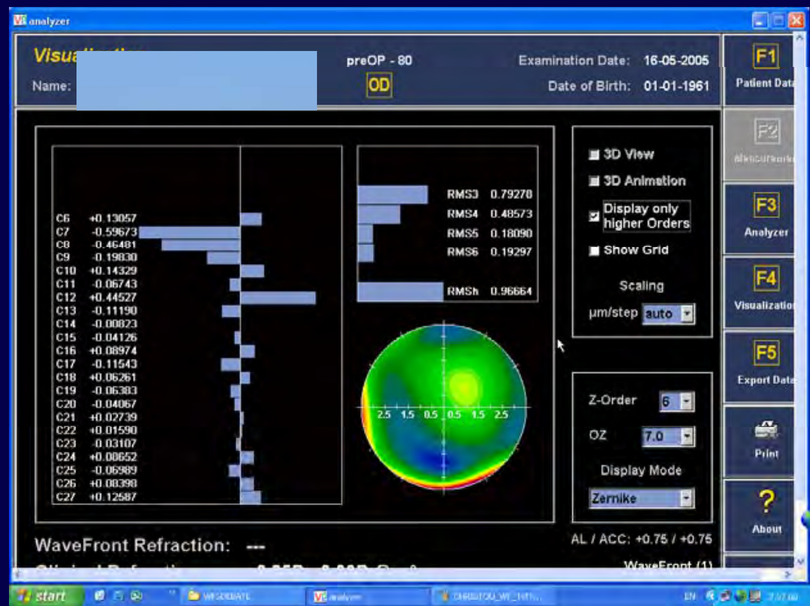
Same pt other eye RMSH improved from 1,2 to 0.36 (!) LCS improved from C3 to C7 (!)



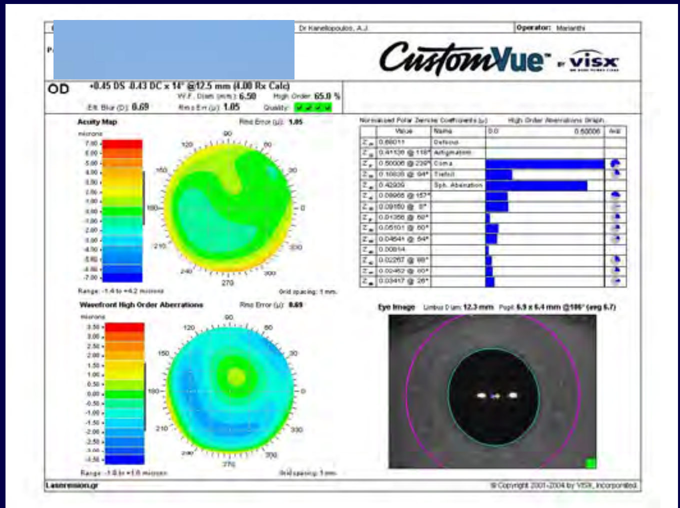
WG enhancement-poor result

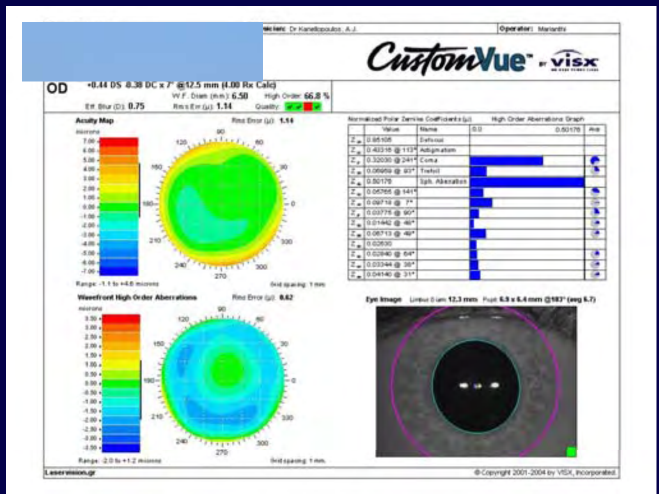






Wave-guided enhancement





- 30y/o nurse s/p LASIK OU X 3 years night vision problems -0.5 SE
- The OD improved from 20/25 to 20/15
- Significant reduction in coma

Kanellopoulos, MD www.brilliantvision.com

Topography-guided, our 5th year

JRS Sept/Oct 2005

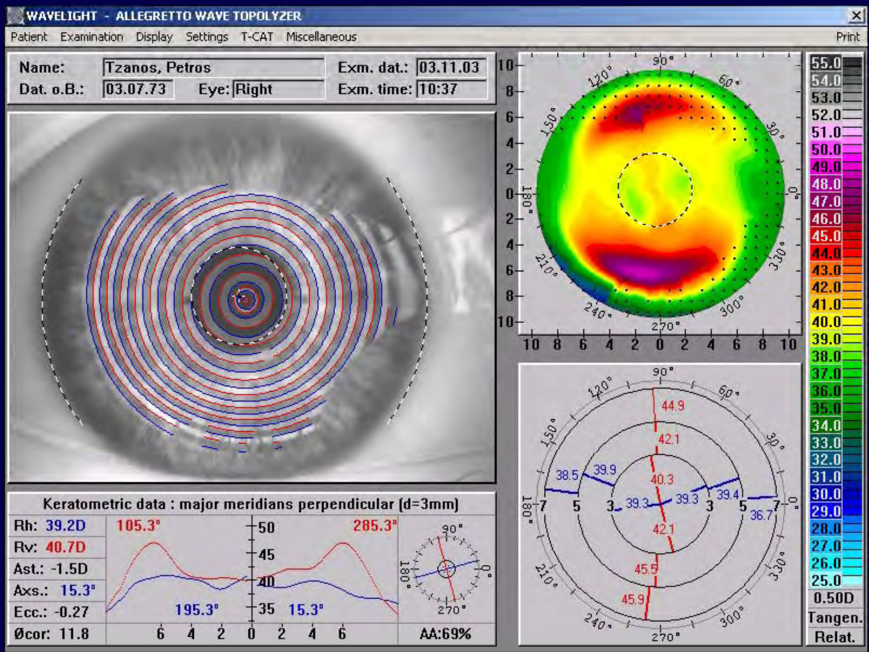
Wavelight topo-link platform
Utilyzing the Oculus topolyzer

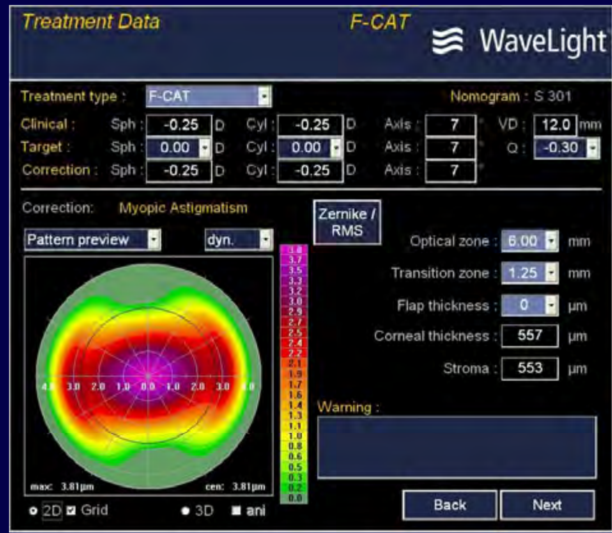
QuickTime™ and a
TIFF (LZW) decompressor
are needed to see this picture.

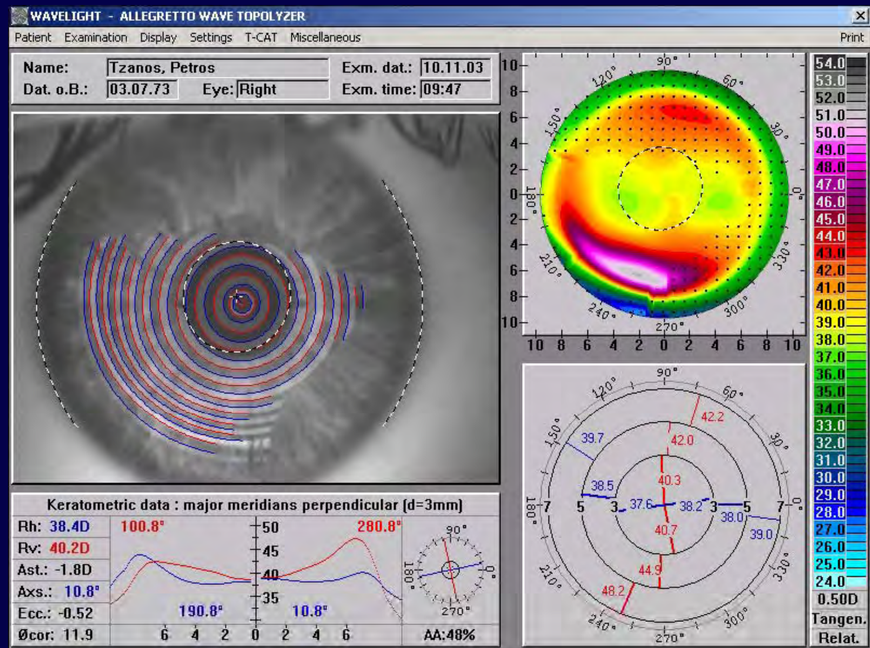
Kanellopoulos, MD www.brilliantvision.com

Unhappy LASIK Topo-guided for small residual cyl and Q adjustment to -0,46

pTG: UCVA 20/20 happy

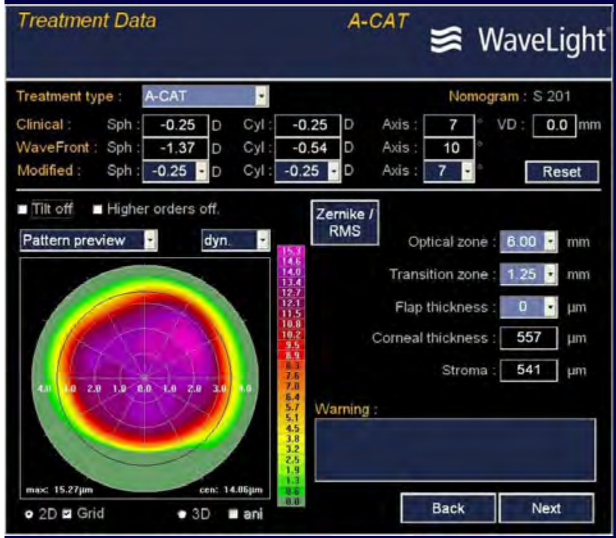






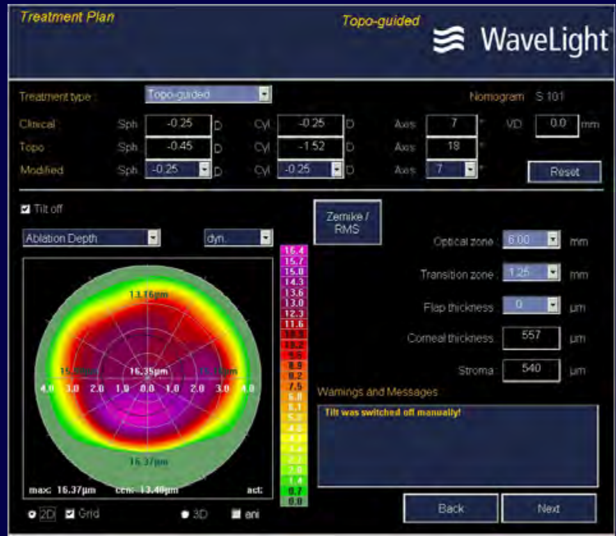
Kanellopoulos, MD   www.brilliantvision.com

What other option were there?



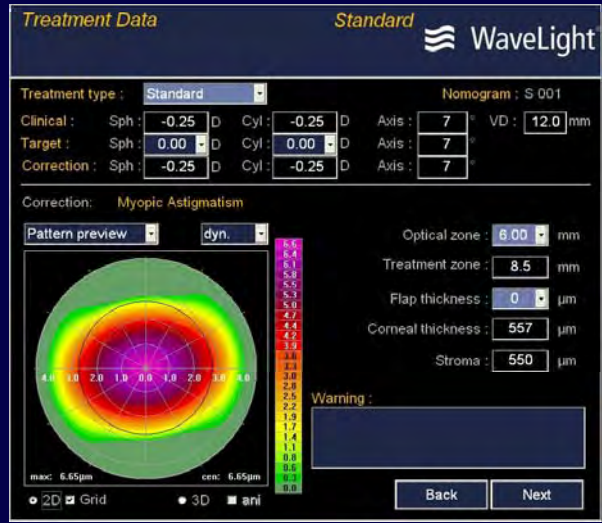
Wave

15 microns



Topo

11 microns



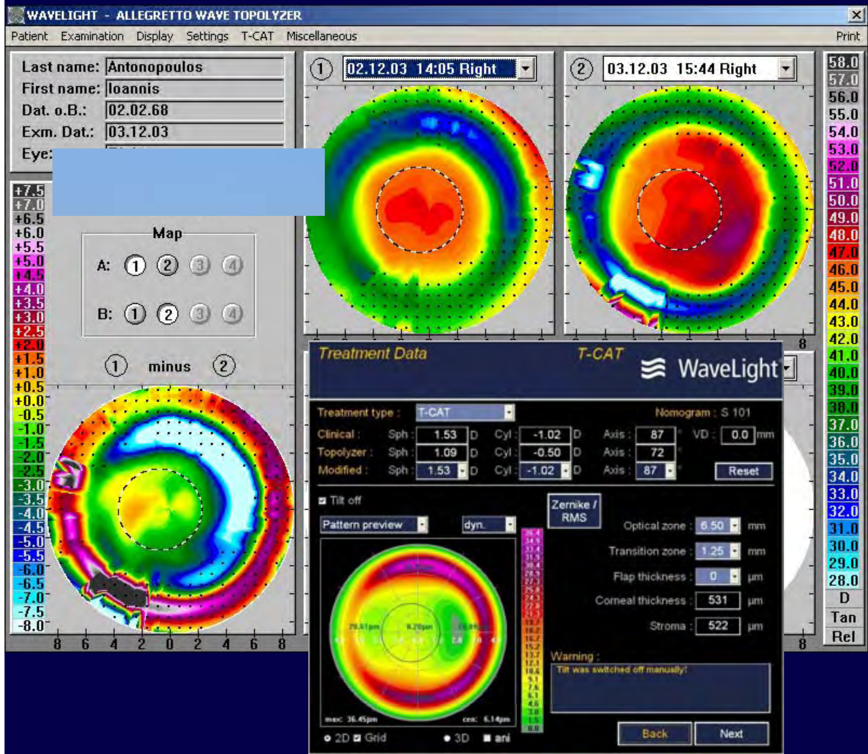
Standard

7 microns

Kanellopoulos, MD www.brilliantvision.com

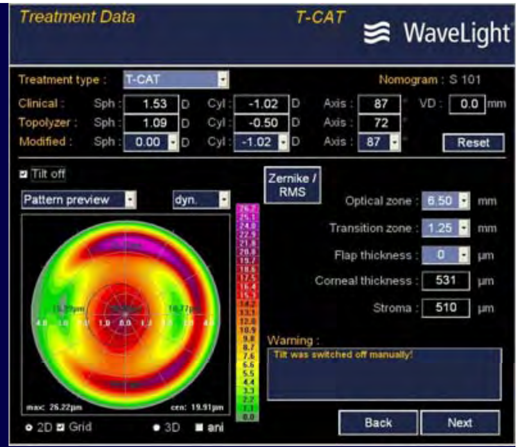
How to Enlarge optical zone in Hyperopia?

S/p LASIK for +4.50, now +1.00 -1.00

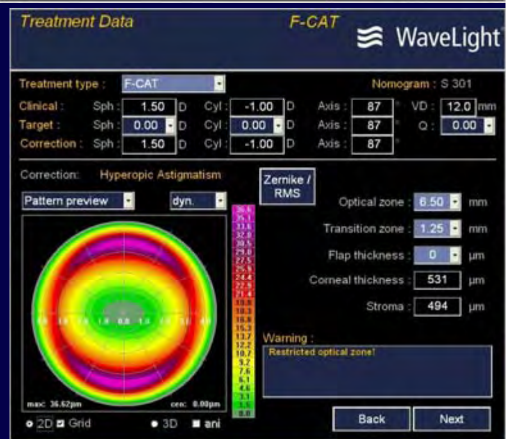


Topo-guided

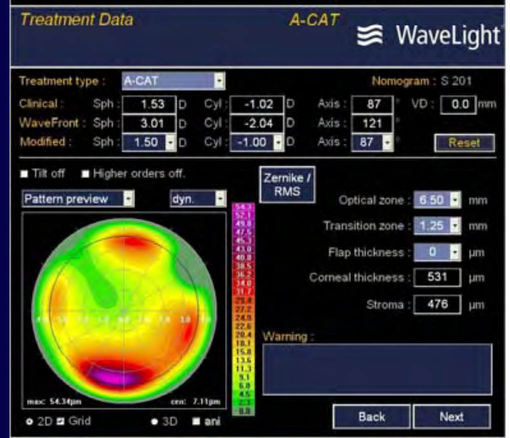
Topo-guided Without sphere



Asphericity adjusted

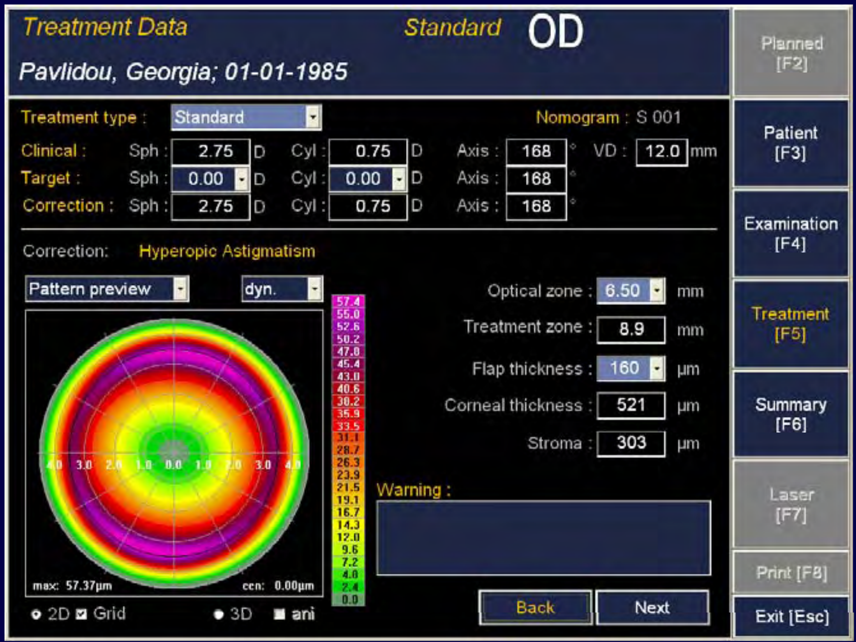


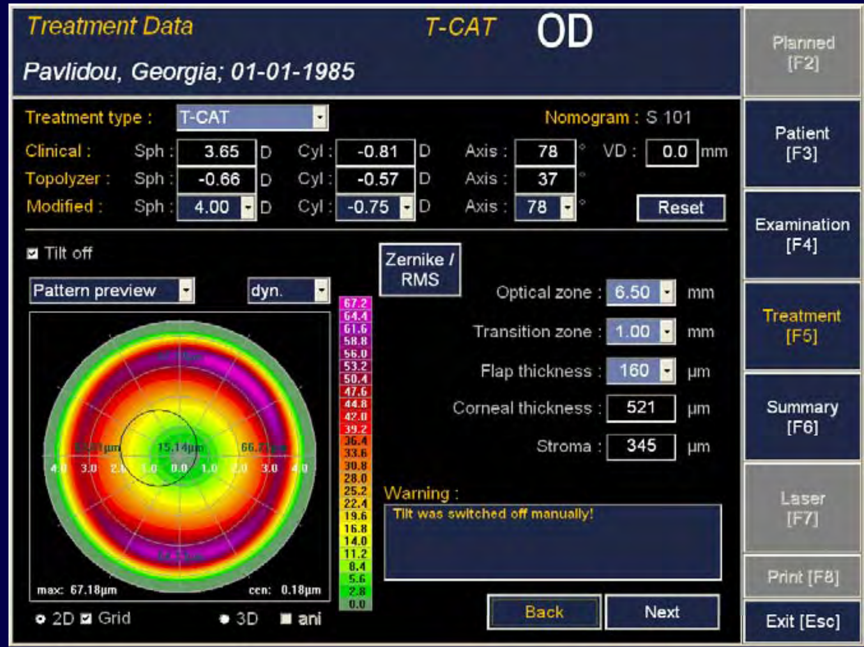
Wavefront guided



Kanellopoulos, MD www.brilliantvision.com

Angle kappa



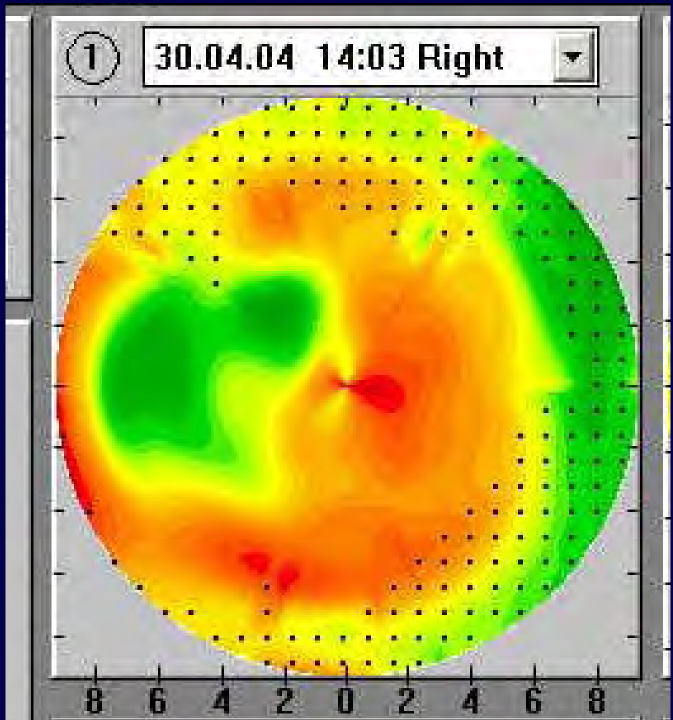


These figures depict the same planned excimer profile for the correction of hyperopic astigmatism on the left: centered on the papillary center and on the right :adjusted by topography to ake into consideration and adjust for angle kappa

Kanellopoulos, MD   www.brilliantvision.com

Post-keratitis irregular astigmatism

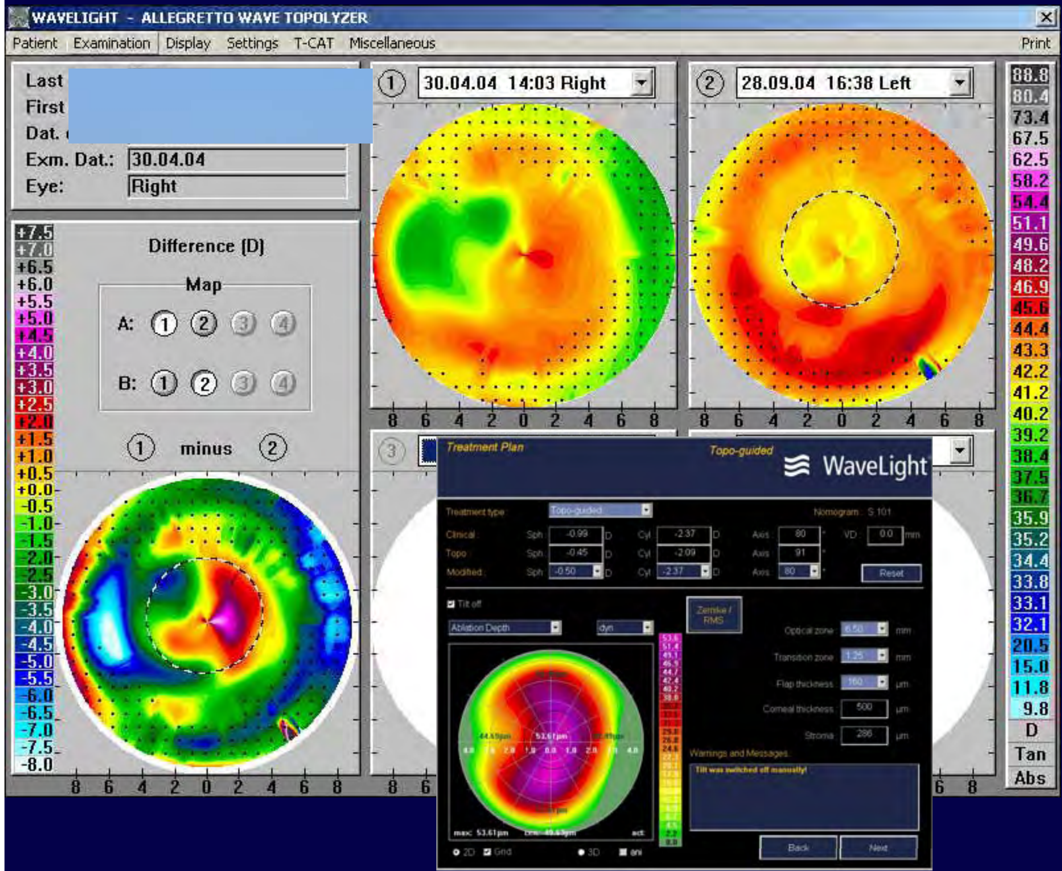
-3.50-2.00 irregular cyl UCVA
20/200 to 20/25
BSCVA from 20/40- to 20/25

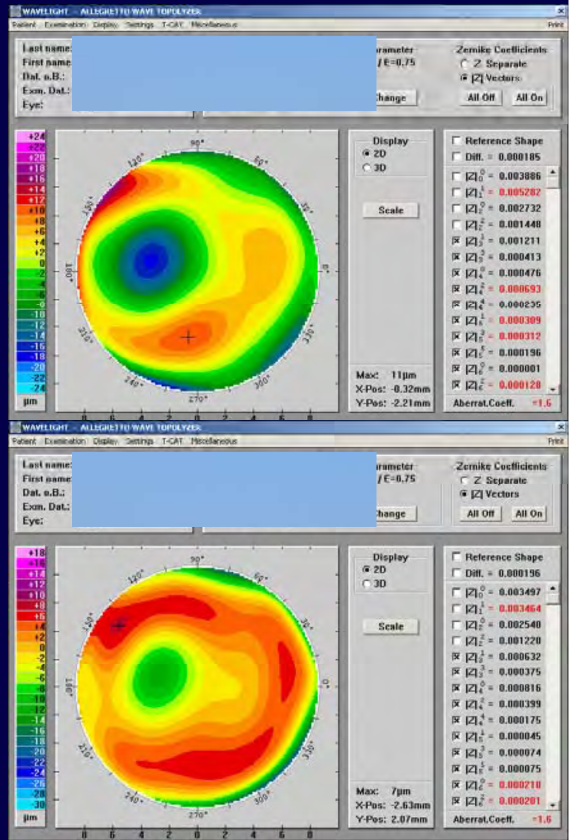


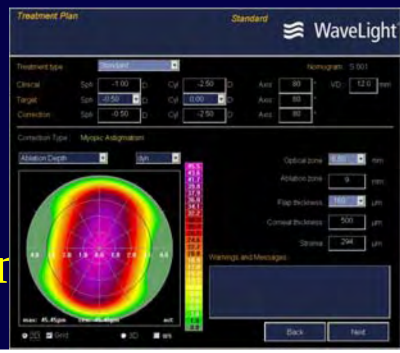
Unable to image with
wavefrot analyzer

Post-keratitis irregular astigmatism

-3.50-2.00 irregular cyl UCVA 20/200 to 20/25
BSCVA from 20/40- to 20/25

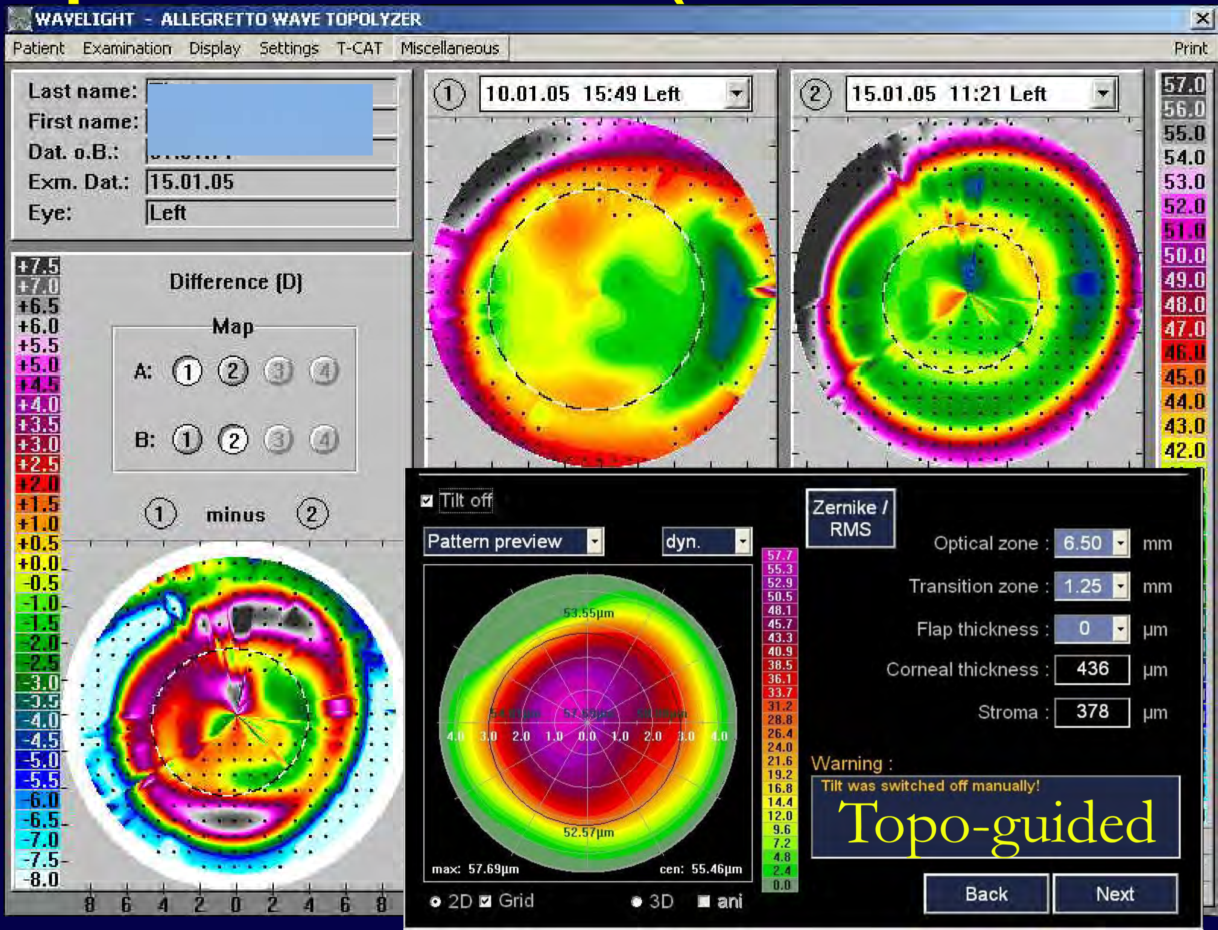




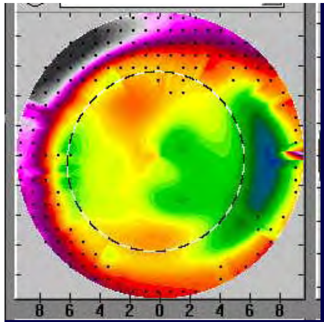


Kanellopoulos, MD www.brilliantvision.co

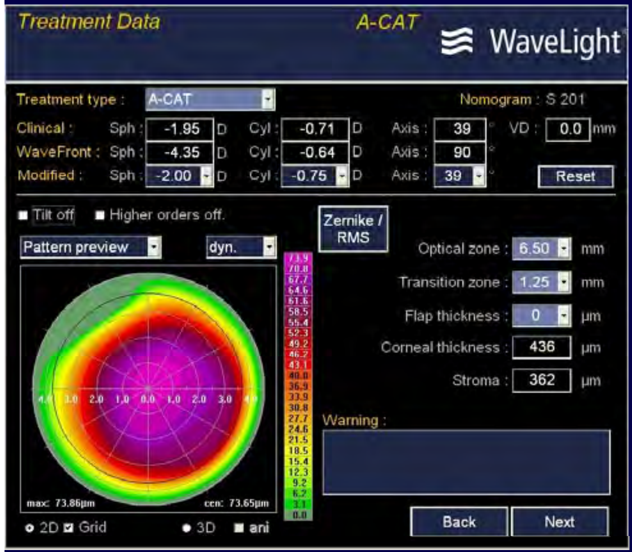
Flap complications: A cornea after 4 LASIK procedures (Loss of K sliver)



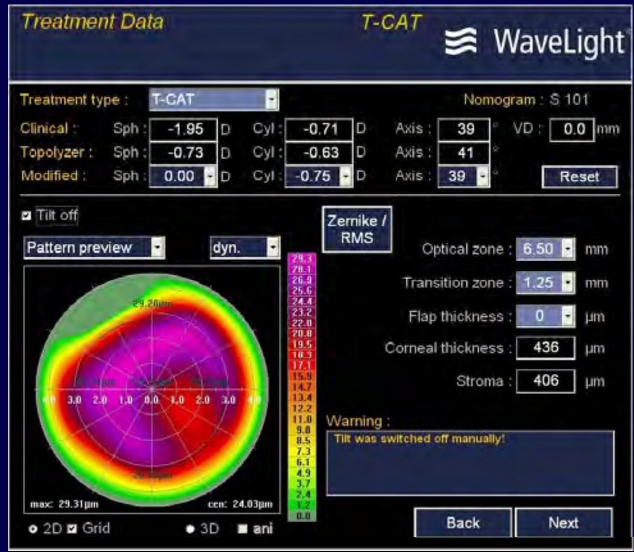
Kanellopoulos, MD   www.brilliantvision.com



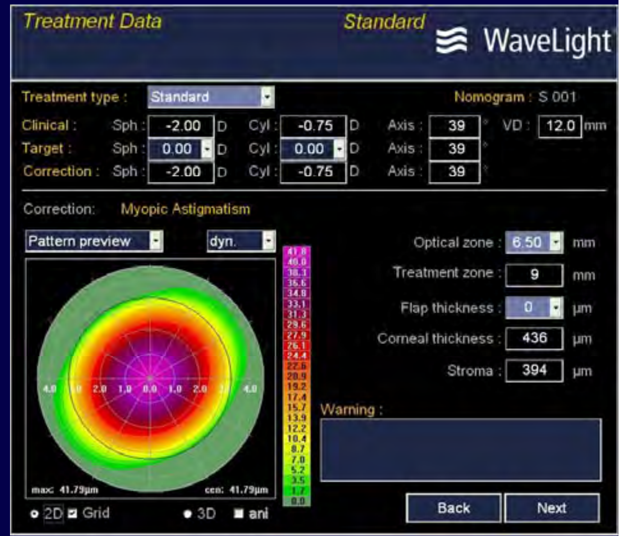
Alternative treatments



wave



topo

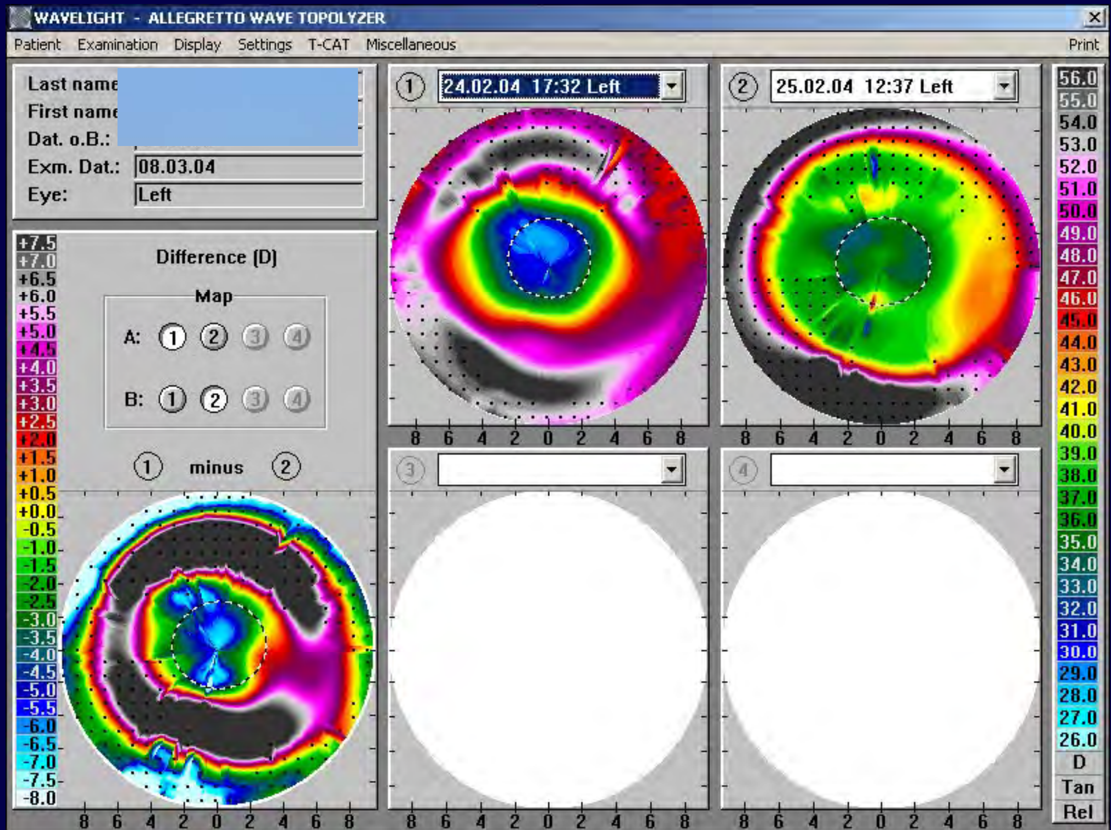


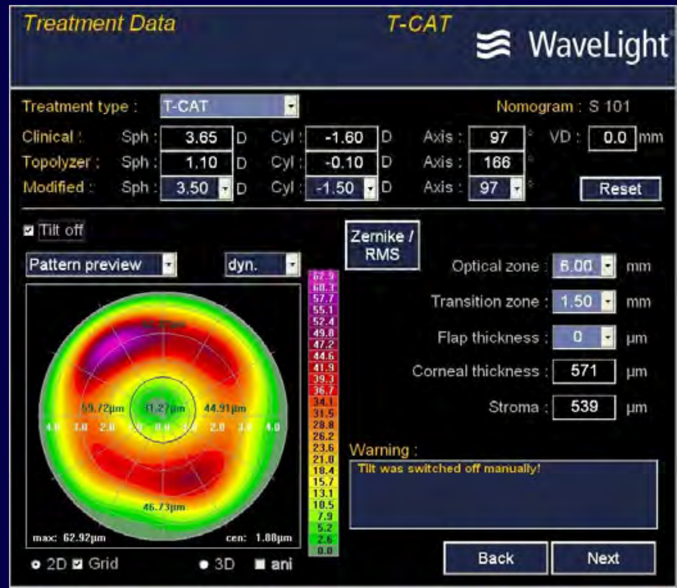
standard

Kanellopoulos, MD www.brilliantvision.com

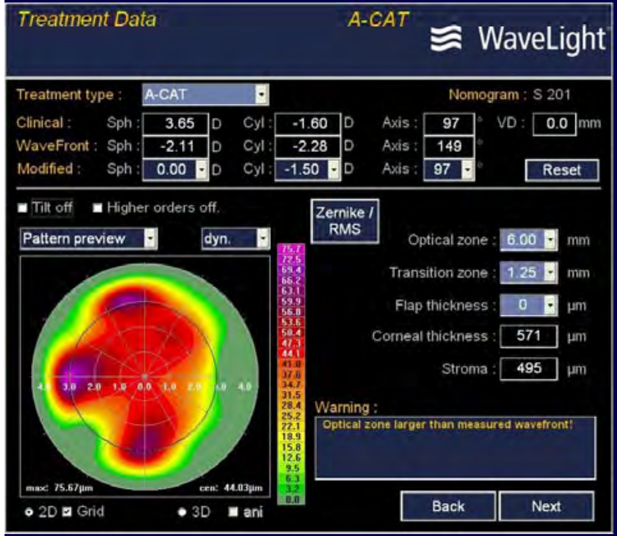
Enlarging optical zone-RK

10 year post-RK, Post-LASIK: +2,50 -1,50Cyl, debilitating night vision. P topo-guided -0.50 -0.50 marked improvement

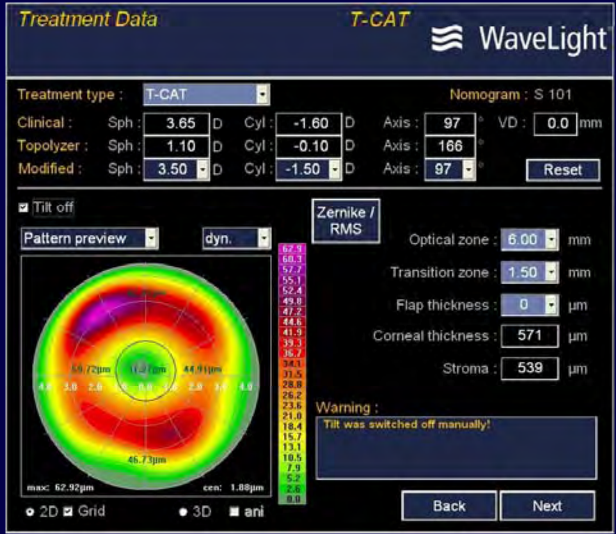




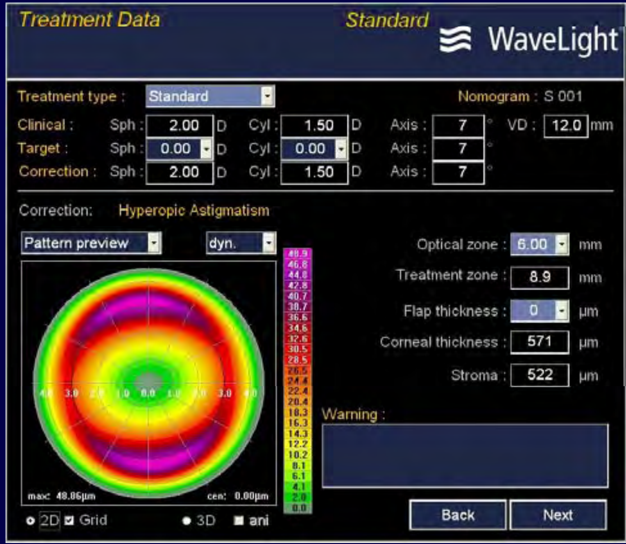
Alternative treatments



wave



topo



standard

Kanellopoulos, MD www.brilliantvision.com

Post-LASIK ectasia: Stabilization and Effective management with Riboflavin / ultraviolet A-induced collagen cross-linking.

Sheila Barbarino, MD, A. John Kanellopoulos, MD[1,2,3] , Thanos D. Papakostas MD[3]

Department of Ophthalmology, New York University / Manhattan Eye, Ear, and Throat Hospital, New York, NY
Laser Vision Eye Institute, Athens Greece

PURPOSE

To evaluate the clinical safety and efficacy of riboflavin/UVA induced collagen cross-linking for stabilizing the progression of post-LASIK ectasia and keratoconus.

DESIGN

Prospective, non-randomized clinical pilot study.

METHODS

7 eyes of 5 patients with mod to advanced ectasia following LASIK were included. After central corneal abrasion, photosensitizing riboflavin drops were applied the eyes were exposed to UVA(370 nm, 3 mW/cm^2) in a 2 cm distance for 30 minutes. Post operative examinations were performed in the 6 month intervals, including visual acuity testing, corneal topography, slit-lamp examination, endothelial cell count density, elasticity testing with a contact ultrasonic device, and clinical photographic documentation. At the 3 month interval 6 eyes were further treated with PRK in order to facilitate visual rehabilitation.

SURGICAL TECHNIQUE:

UVA CCL:

We subsequently and treated with a single treatment of UVA treatment of 370 nm wavelength and 3mV/cm2 radiance with the Keracure device (Priavision, CA, USA) for 30 minutes with the use of 0.1% riboflavin ophthalmic solution (Priavision, CA, USA) one drop every two minutes in order to "soak" the stromal bed and protect the iris, crystalline lens and retina.

This treatment was performed following removal of the cornea epithelium with a pre-treatment of 20% ETOH solution placed on the surface for 20 minutes.

At the end of the UVA CCL, a bandage contact lens was placed onto the cornea and the patient treated with ofloxacin, prednisolone acetate 1%, four times a day for 10 days. The contact lens was removed at day 4 following complete re-epitheliazation

RESULTS

In all treated eyes, the progression of keratoconus appeared to stabilize. In 6 eyes regression with a reduction of maximal keratometry readings by 3.01 D and of the refractive error by 2.14 D was found. Corneal and lens transparency, ECC and IOP were unchanged. Cornea elasticity measurements changed from an average 15.75 m/sec pre-op to 32.25 post-op. Visual acuity, both UCVA (20/100 to 20/60) and BSCVA (20/50 to 20/25) improved drastically in all 7 eyes.

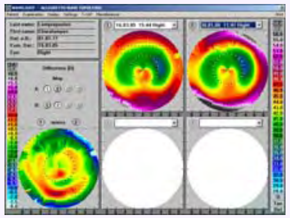


Figure 1. Pre and post UVA CCL in an LASIK ectasia case

The difference map depicts the "flattening" of the central ectasia. The improvement establishes the short term stability.

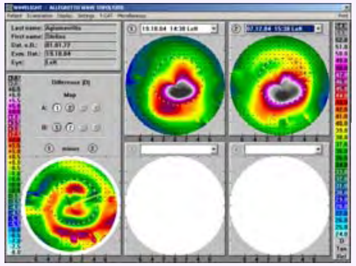


Figure 2. 1: The cornea topography of this case when first seen by the authors with central cornea ectasia. At this point BSCVA was 20/200

2: The cornea topography here is 10 months following UVA collagen cross-linking.. The central steepening is still present, although reduced. At this point UCVA is 20/100 and BSCVA was 20/70

3-The lower row image on the left is a comparison map. This map depicts the difference of subtracting the cornea topography 2 (final result) from the cornea topography 1 (original state of this complication when encountered by us). The difference demonstrated the improvement of the central ectasia .

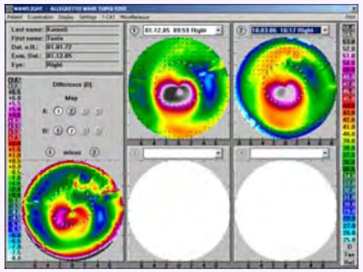


Figure 3. 1: The cornea topography of this case when first seen by the authors with central cornea ectasia. At this point BSCVA was 20/400

2: The cornea topography here is 3 months following UVA collagen cross-linking.. The central steepening is still present, although reduced. At this point UCVA is 20/100 and BSCVA was 20/80

3-The lower row image on the left is a comparison map. This map depicts the difference of subtracting the cornea topography 2 (final result) from the cornea topography 1 (original state of this complication when encountered by us). The difference demonstrated the improvement of the central ectasia .

Pre-LASIK ectASIA (with INTACS)

Post-LASIK ectASIA

CONCLUSION

Larger comparative studies and longer follow up is obviously necessary in order to validate the long-term efficacy of this combined treatment with UV / riboflavin followed by topography-guided excimer laser treatment, but the refractive and topographic stability of more than a year appears to validate this minimally invasive treatment of iatrogenic keratectasia and leads us to believe that it may have an even wider application in the near future.

REFERENCES

1. Seiler T, Koufala K, Richter G. Iatrogenic keratectasia after laser in situ keratomileusis. J Refract Surg 1998; 14(3):312-317
2. Binder PS. Ectasia after laser in situ keratomileusis. J Cataract Refract Surg 2003; 29(12):2419-2429
3. Lifshitz T, Levy J, Klemperer I, Levinger S. Late bilateral keratectasia after LASIK in a low myopic patient. J Refract Surg. 2005;21(5):494-6
4. Guell JL. Are intracorneal rings still useful in refractive surgery? Curr Opin Ophthalmol. 2005;16(4):260-5
5. Kanellopoulos AJ, Pe LH, Perry HD, Donnenfeld ED: Modified Intracorneal Ring Segment Implantations (INTACS) for the Management of Moderate to Advanced Keratoconus: Efficacy and Complications. Cornea 25(1): 29-33, January 2006.
6. Hiatt JA, Wachler BS, Grant C. Reversal of laser in situ keratomileusis-induced ectasia with intraocular pressure reduction. J Cataract Refract Surg. 2005;31(8):1652-5
7. Seiler T. [Iatrogenic corneal ectasia after LASIK--is the end in sight?] Klin Monatsbl Augenheilkd. 2005;222(5):429
8. Dupps WJ Jr. Biomechanical modeling of corneal ectasia. J Refract Surg. 2005;21(2):186-90
9. Guirao A. Theoretical elastic response of the cornea to refractive surgery: risk factors for keratectasia. J Refract Surg. 2005;21(2):176-85
10. Toshino A, Uno T, Ohashi Y, Maeda N, Oshika T. Transient keratectasia caused by intraocular pressure elevation after laser in situ keratomileusis. J Cataract Refract Surg. 2005;31(1):202-4
11. Alio JL, Claramonte PJ, Caliz A, Ramzy MI. Corneal modeling of keratoconus by conductive keratoplasty. J Cataract Refract Surg. 2005 Jan;31(1):190-7
12. Spoerl E, Seiler T. Techniques for stiffening the cornea. J Refract Surg 1999; 15(6):711-713
13. Wollensak G, Spoerl E, Seiler T. Riboflavin/ultraviolet-a-induced collagen crosslinking for the treatment of keratoconus. Am J Ophthalmol 2003; 135(5):620-627
14. Wollensak G, Spoerl E, Wilsch M, Seiler T. Endothelial cell damage after riboflavin-ultraviolet-A treatment in the rabbit. J Cataract Refract Surg 2003; 29(9):1786-1790
15. Hafezi F, Mrochen M, Jankov M, Hopeler T. Wiltfang R, Kanellopoulos AJ, Seiler T. Corneal collagen crosslinking with riboflavine/UVA for the treatment of induced keratectasia after laser in situ keratomileusis. in press
16. Kanellopoulos AJ, Topography-guided Custom re-treatments in 27 symptomatic eyes. J Refract Surg. Sept/Oct 2005; 21:S513-S518.
17. Donnenfeld ED, Kanellopoulos AJ : Therapeutic Penetrating Keratoplasty. Chapter 150. Volume III. Pages 1843-1872. In : J.H.Krachmer, M.J.Mannis, E.J.Holland: CORNEA , 1997 Mosby (St. Louis, MO)

Supported by Research to Prevent Blindness

Methods

UVA CCL followed by a topography-guided SEA in 27 eyes.

Refraction, UCVA, BSCVA, topography (TP), endothelial cell count (ECC) and pachymetry (PC) were evaluated for 23 (14-29) months. 370 nm UV of 3 mW/cm^2 for 30 min used for UVA CCL.

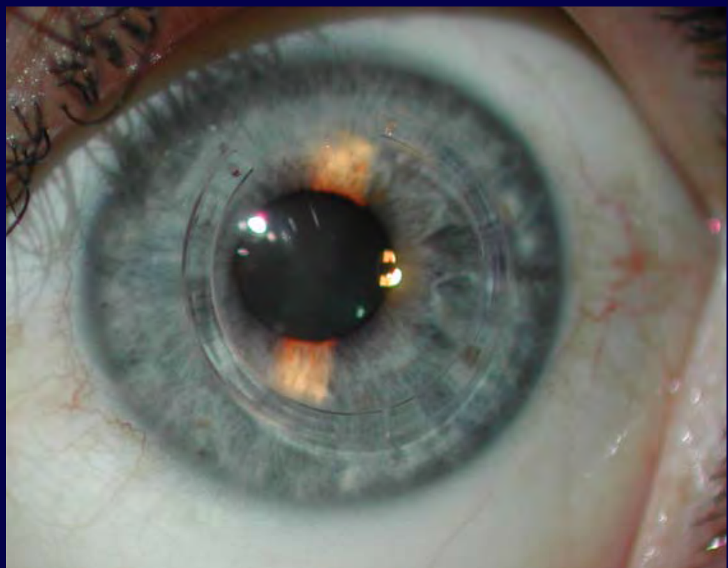
The Wavelight topo-guided system was used for the limited surface ablatio

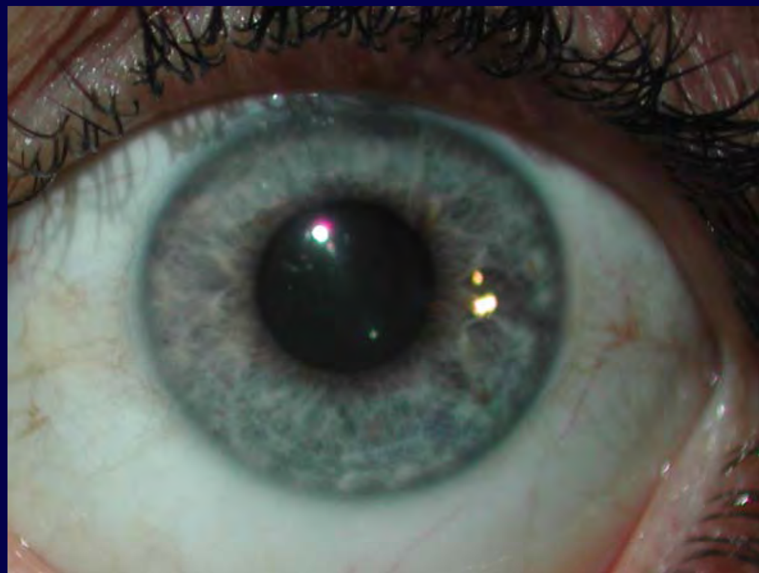
Kanellopoulos, MD www.brilliantvis

UVA: 3mW / cm2 for 30 minutes (Priavision device)

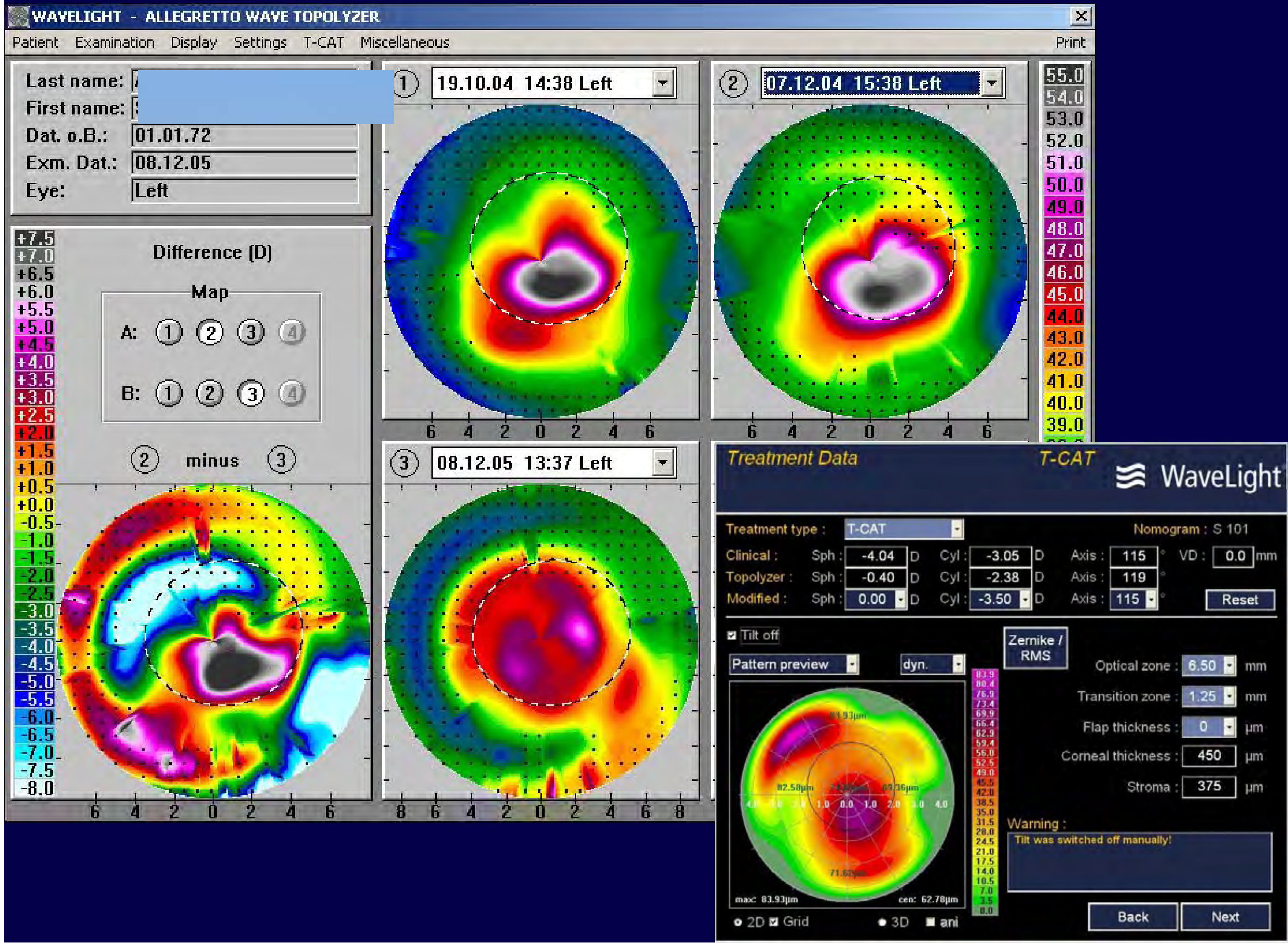
Kanellopoulos, MD www.brilliantvision.com

Keratoconus post LASIK: UCVA 20/400, removal of INTACS and then UVA. Post-op to 20/80





6 months after the CCL topo-guided PRK



Post-LASIK Ectasia

Dear Editor:
I report a patient who had post-LASIK ectasia and was managed in a novel fashion, without keratoplasty.

A 29-year-old male underwent uniocular LASIK 38 months ago. Little detail was available from the patient and the surgeon. His original uncorrected visual acuity (UCVA) was 20/80, and his spectacle-corrected visual acuity (BSCVA) was 20/20 with refraction of sphere being −2.00−175×85. Initially, the patient reported that vision was good. During the following months, vision in that eye deteriorated. The original LASIK surgeon diagnosed ectasia and recommended the placement of Intacs. After Intacs placement, his vision did not improve, and the patient developed severe night vision halos.

The treating LASIK surgeon then recommended penetrating keratoplasty (PK) as the next step, and the patient came for a second opinion for PK. 11 months after the original LASIK procedure and 3 months after Intacs implantation. Corneal topography is shown in Figure 1 (available at http://aaojournal.org); the central corneal thickness was 410 μm, and the endothelial cell count was 2750 cells/mm^2 (Conan, MA). I discussed with the patient the following:

1. The poor long-term experience with Intacs in post-LASIK ectasia that I have reported.[1]
2. The benefits and risks of PK.
3. Combined ultraviolet radiation and riboflavin treatment to achieve collagen cross-linking and biomechanical stabilization of the ectasia.

After informed consent was given, I removed the Intacs. Two weeks later, I treated the ecstatic cornea with a single application of combined ultraviolet radiation and riboflavin treatment to achieve collagen cross-linking at 3 mW/cm^2 for 30 minutes (KeraCure, Priavision, Menlo Park, CA) combined with the use of 0.1% riboflavin ophthalmic solution in 20% dextran T-500.

The treatment was performed after 20% alcohol-assisted epithelial removal. The riboflavin solution was then applied for approximately 2 minutes to soak the stromal bed and protect the iris, crystalline lens, and retina from the ultraviolet A irradiation, and then 1 drop every 2 minutes. A bandage contact lens was placed onto the cornea for 5 days and the patient treated with topical ofloxacin 1% (Ocuflox, Allergan, Irvine, CA) and prednisolone acetate 1% (Pred-forte, Allergan) 4 times a day for 10 days.

At 3 months, his UCVA improved from 20/400 to 20/70 and his BSCVA from 20/200 to 20/40. Refraction changed from −4.50−4.50×120 to −4.00−3.50×115, and corneal topography changed as seen in Figure 1. The stability of these parameters and the corneal topography between months 1 and 3 of this treatment encouraged me to proceed with topography-guided photorefractive keratectomy (PRK) to reduce the irregular astigmatism and try to provide the patient with a visual acuity not requiring the use of spectacles or a soft contact lens.

The corneal thickness at that point of 420 μm enabled a PRK of his full spectacle correction with a topography-guided customized ablation on top of the LASIK flap (T-CAT software, Wavelight excimer laser, Erlangen, Germany). At the first post-PRK month, UCVA was 20/20$^-$ and BSCVA 20/20, with a refraction of +0.50−0.50×160. There was no corneal endothelium count change. It is now 24 months after the operation and the patient enjoys UCVA of 20/20, although there are some mild night vision problems. Postoperative corneal topography is shown on Figure 1.

The most frequent management for post-LASIK ectasia has been PK.[2,3] Previous reports of the use of combined ultraviolet radiation and riboflavin treatment to achieve collagen cross-linking mention a slowing down of keratoconus.[4] We have reported the management of extreme cornea irregularity with topography-guided ablations.[5] This is the first report of management of post-LASIK ectasia with combined ultraviolet radiation and riboflavin treatment to achieve collagen cross-linking followed by customized PRK for visual rehabilitation. The apparent corneal stabilization, along with the successful visual rehabilitation, suggests that this approach may have a wider application as an alternative to therapeutic PK.

Larger comparative studies and longer follow-up are obviously necessary to validate the long-term efficacy of this combined ultraviolet radiation and riboflavin treatment followed by a surface excimer laser treatment. Nevertheless, the refractive and topographic stability for 2 years appears to validate this minimally invasive treatment of iatrogenic keratectasia and leads me to believe that it may have an even wider application in the near future.

A. John Kanellopoulos, MD
Athens, Greece

References

1. Binder PS. Ectasia after laser in situ keratomileusis. J Cataract Refract Surg 2003;29:2419–29.
2. Kanellopoulos AJ, Pe LH, Perry HD, Donnenfeld ED. Modified intracorneal ring segment implantations (INTACS) for the management of moderate to advanced keratoconus: efficacy and complications. Cornea 2006;25:29–33.
3. Wollensak G, Spoerl E, Seiler T. Riboflavin/ultraviolet-A-induced collagen crosslinking for the treatment of keratoconus. Am J Ophthalmol 2003;135:620–7.
4. Kanellopoulos AJ. Topography-guided custom retreatments in 27 symptomatic eyes. J Refract Surg 2005;21:S513–8.
5. Donnenfeld ED, Kanellopoulos AJ. Therapeutic keratoplasty. In: Krachmer JH, Mannis MJ, Holland EJ, eds. Cornea. Vol. 3. St. Louis: Mosby; 1997:1843–54.

First report: J Ophthalm 6/07

Pentacam-linked (since 4 2006)

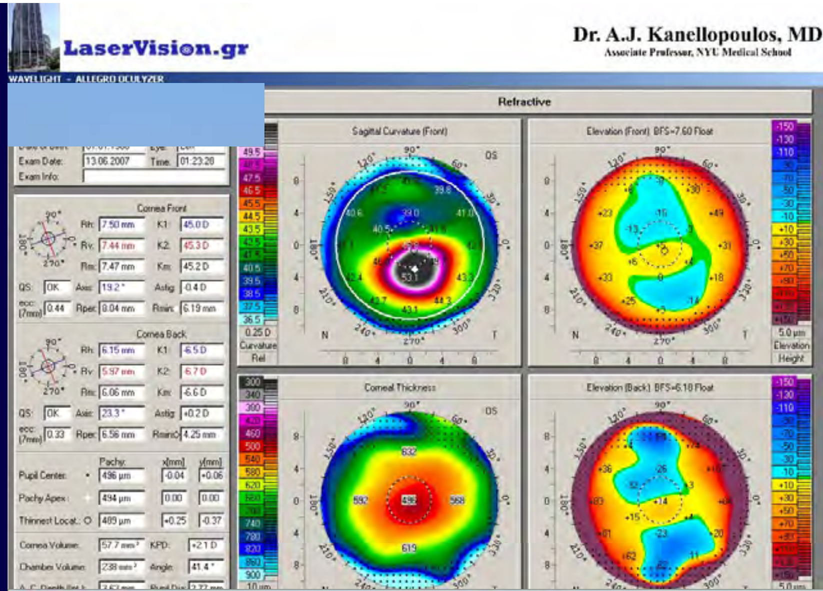
A 24 y/o pilot

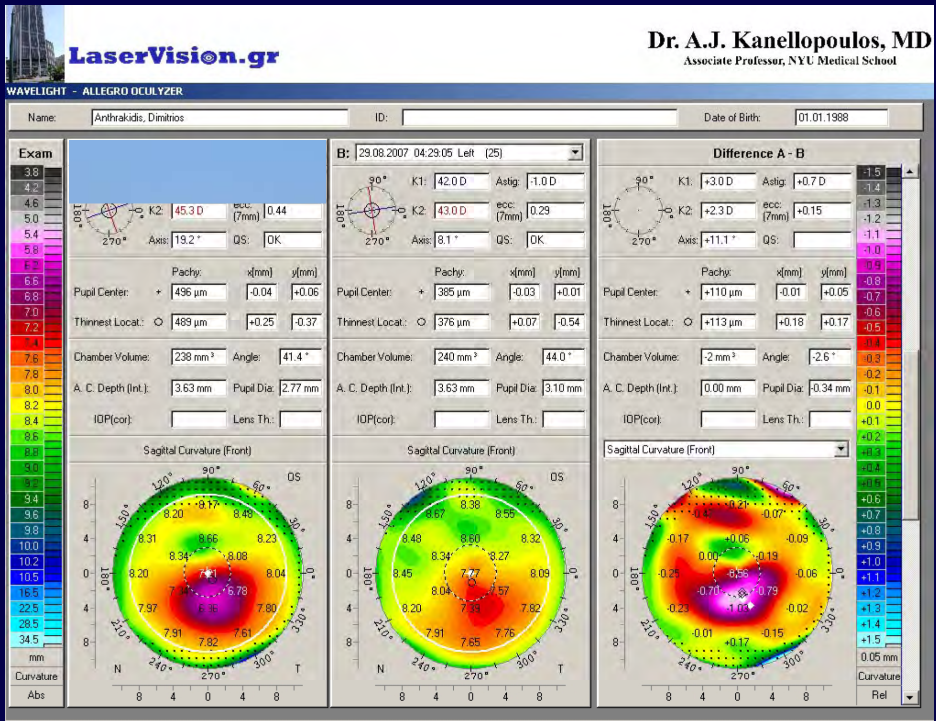
Pre: UCVA 20/200

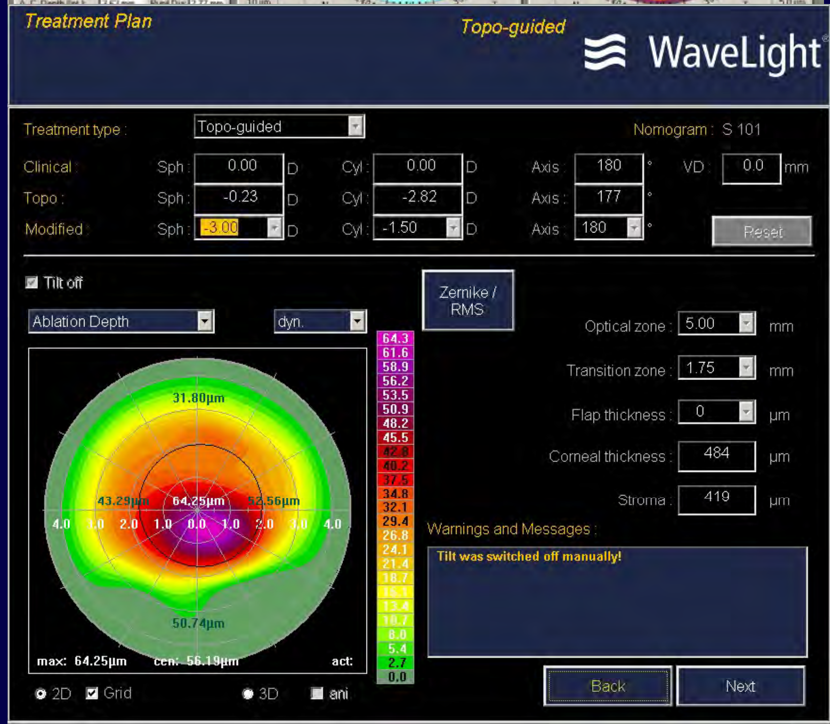
-4.5 -1.50 X 180 20/30

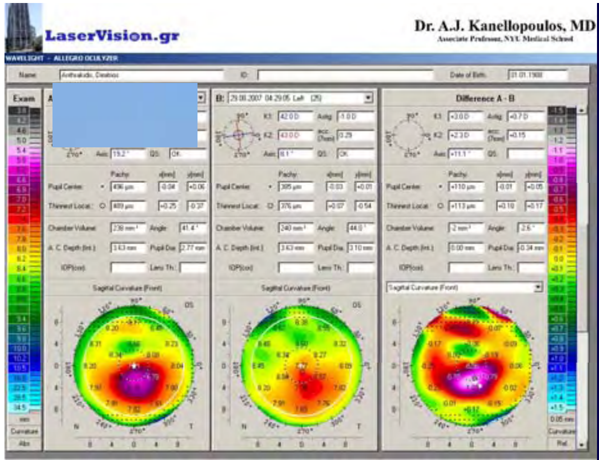
2 months post: UCVA 20/20

-0.25 -0.75 X34

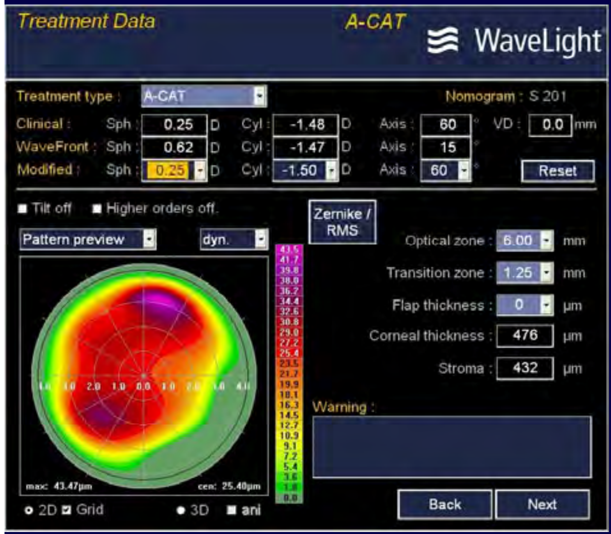


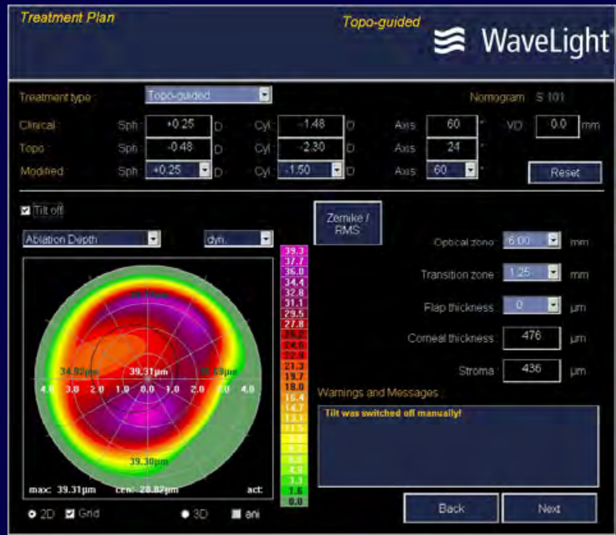


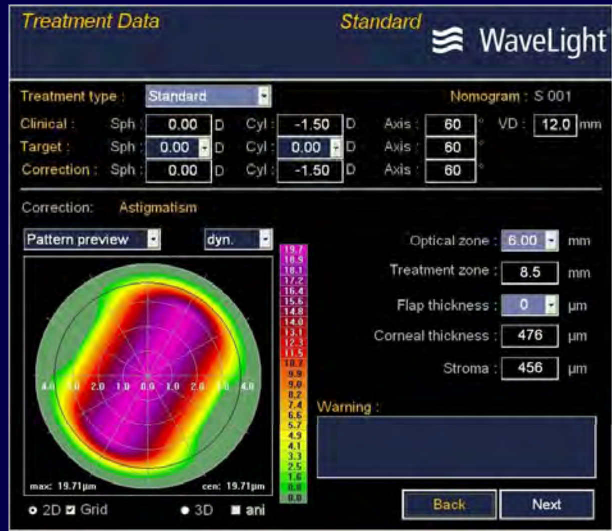




Alternative treatments:







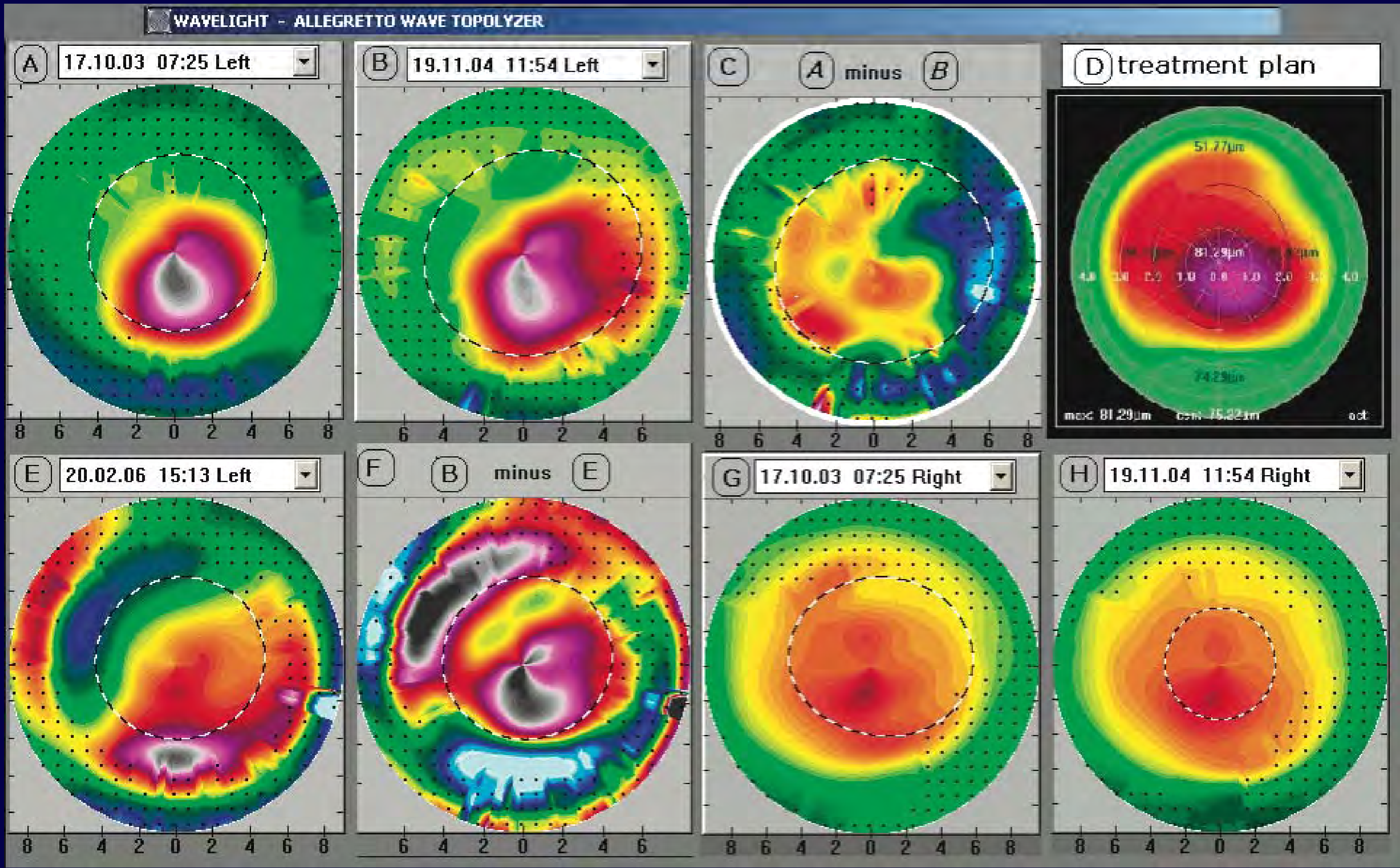
Wave

Topo

Standard

keratoconus

27 y/o left eye is treated and the right observed over 3 years



Collagen Cross-Linking (CCL) With Sequential Topography-Guided PRK

A Temporizing Alternative for Keratoconus to Penetrating Keratoplasty

A. John Kanellopoulos, MD†‡ and Perry S. Binder, MS, MD§*

Purpose: To assess the effectiveness of ultraviolet A (UVA) irradiation–induced collagen cross-linking (CCL) on keratoconus (KC) progression.

Methods: A patient with bilateral, progressive KC underwent UVA irradiation (3 mW/cm^2 for 30 minutes) after topical 0.1% riboflavin drops over a deepithelialized cornea. Twelve months later, a topography-guided penetrating keratoplasty (PRK; wavelight 400 Hz Eye-Q excimer) was performed in 1 eye for a refractive error of −3.50 −4.00 × 155 by using an attempted treatment of −2.50 −3.00 × 155. At all postoperative follow-up visits to 18 months, uncorrected visual acuity (UCVA), best spectacle-corrected visual acuity (BSCVA), pachymetry, and topography were performed.

Results: In the treated left eye, the UCVA after the UVA CCL improved from 20/100 to 20/80, and the BSCVA improved from 20/50 to 20/40. Eighteen months after the topography-guided PRK, the UCVA was 20/20, and the BSCVA was 20/15, with a refractive error of Plano −0.50 × 150. The cornea was clear, and the endothelial cell count remained unchanged. The untreated right mate eye continued to progress during the same period.

Conclusions: The significant clinical improvement and the apparent stability of more than a year after UVA CCL and subsequent PRK compared with the untreated mate eye, seems to validate this treatment approach for KC. An adjusted nomogram may be considered in the ablation of cross-linked cornea tissue to avoid overcorrections.

Key Words: keratoconus, cornea ectasia, surgical management, collagen cross-linking, ultraviolet A, riboflavin, customized topography-guided cornea ablation, visual rehabilitation

(*Cornea* 2007;26:891–895)

Keratoconus is a bilateral, nonsymmetric, and noninflammatory progressive corneal degeneration. Its incidence has been thought to be 1 in 2000 in the general population,[1] but the increased number of eyes undergoing screening for laser refractive surgery suggests the prevalence may be higher. It can be diagnosed at puberty, with up to 20% of the eyes progressing to the extent that penetrating keratoplasty is indicated.[2] Although spectacles and contact lenses can provide useful vision in many cases, there are several surgical options for those cases that can no longer benefit from them: implantation of intracorneal ring segments (Intacs or Ferrera rings),[3] lamellar keratoplasty,[4] or penetrating keratoplasty.[2] Other ectatic corneal disorders such as Pellucid marginal degeneration[5] and post-LASIK ectasia[6] require similar treatment approaches. Although penetrating keratoplasty for ectatic corneal disorders is highly successful, many eyes require contact lenses to correct the unpredictable topographic changes that are associated with sutures and postsuture abnormal corneal shapes, and sometimes the contact lens is not successful.[7]

In recent years, basic laboratory studies and subsequent clinical studies have suggested that by increasing the collagen cross-linking (CCL) of the corneal stromal collagen, one is able to increase the stiffness (biomechanics?) of the cornea with attendant stabilization of the normally progressive corneal disorder.[8–16] We present a case of bilateral progressive keratoconus that underwent unilateral CCL followed by PRK with an excellent outcome.

CASE REPORT

A 26-year-old male patient had been treated with gas-permeable contact lenses for 8 years before his presentation. Because of debilitating giant papillary conjunctivitis he was no longer able to wear the contact lens; spectacles were unable to provide functional

1 of 5

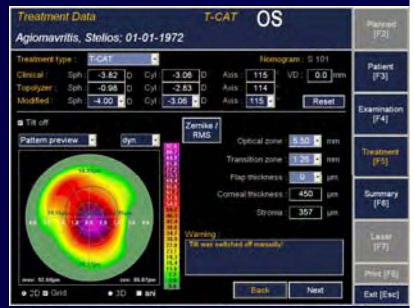
J Cornea August 2007

ision.com

chapter pics

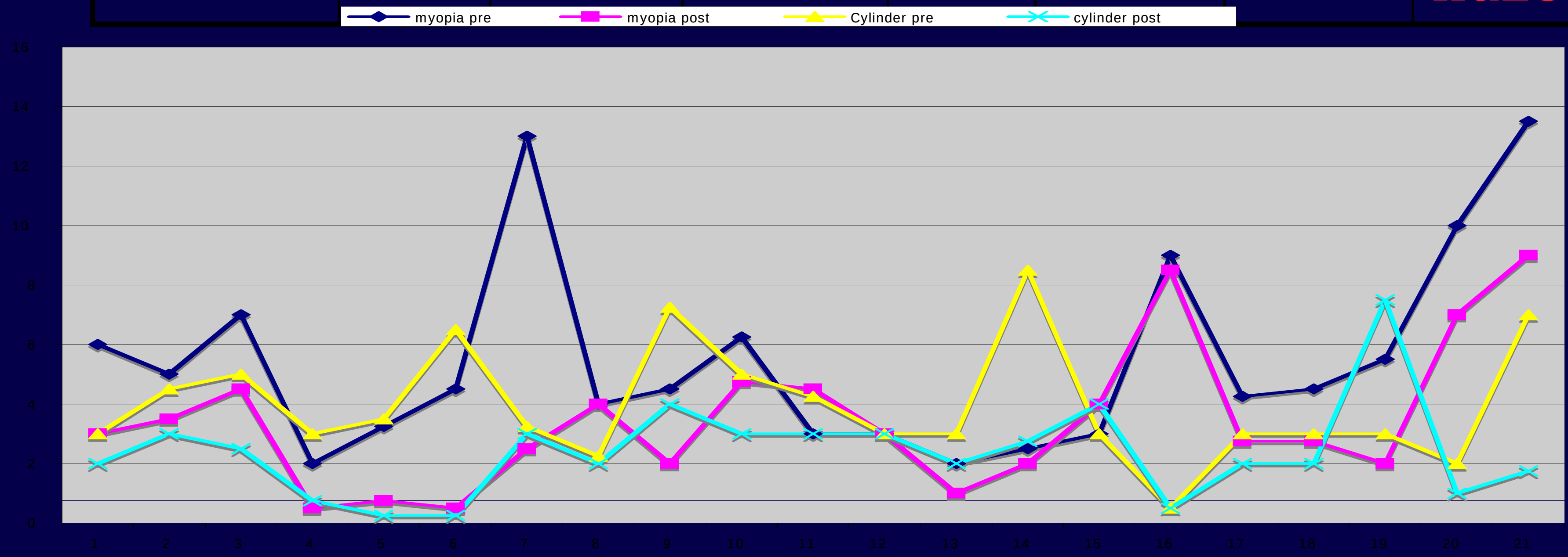
Methods

- Custom Topography-customised surface ablation utilizing Wavelight topo-guided plaform -maximum 50 microns
- MMC 0.02% for 1 min
- Collagen cross-linking with: 370 nm Ultraviolet A Irradiation of 3 mW/cm^2 (Keracure device by Priavision) for 30 min with 1% riboflavin drops every 2 minutes.
- Follow-up 12-26 months
- Refraction, UCVA, BSCVA, topography (TP), endothelial cell count (ECC) and pachymetry (PC) were evaluated.

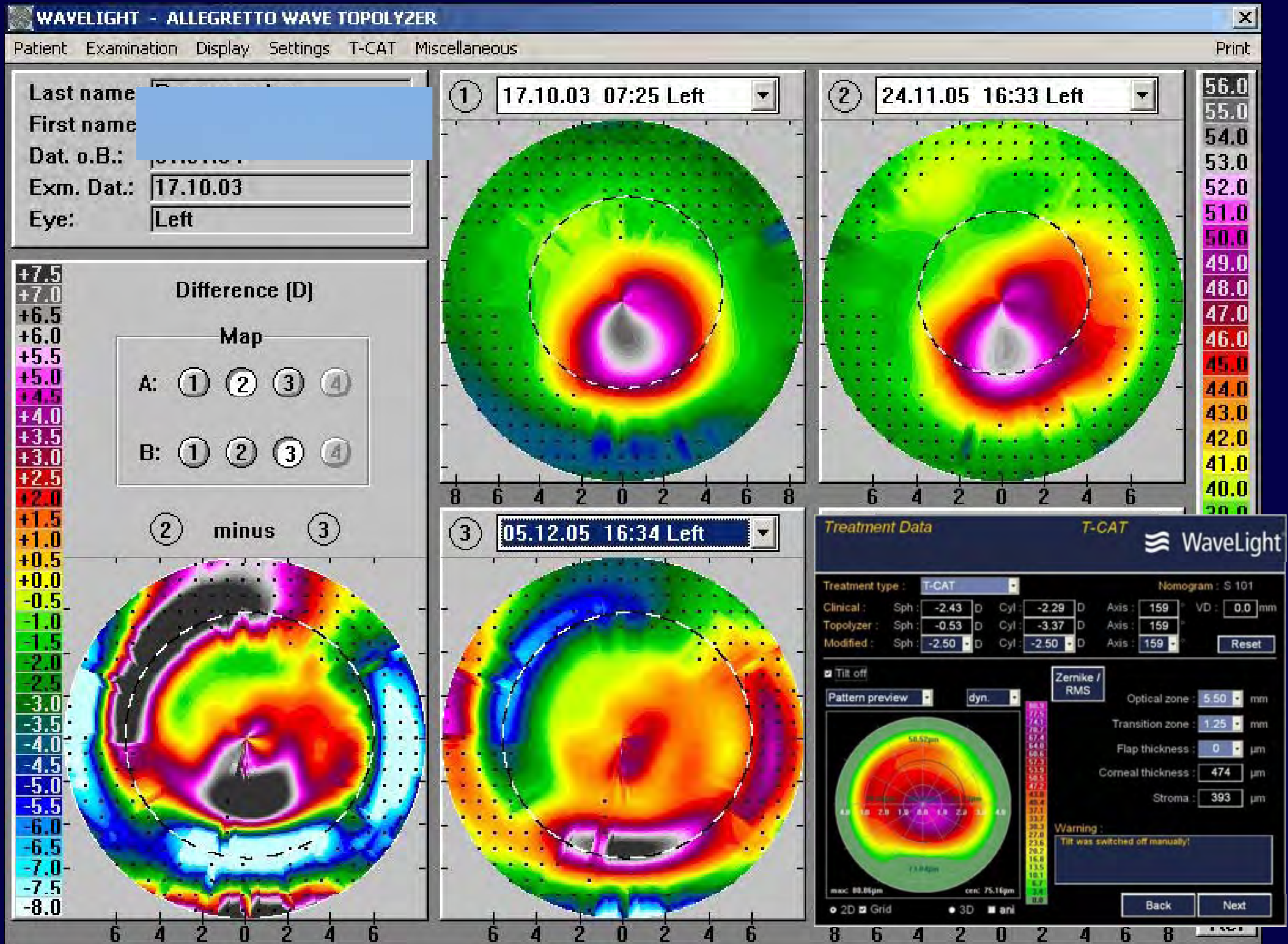


Cumulative average data

	pach	steep K	BSCVA	myopia	cyl	ECC	comp
pre	448	51.5	0.5	2.5	4.5	2850	
12m Post op	397	46	0.7	1.5	2.5	2850	6 cases haze

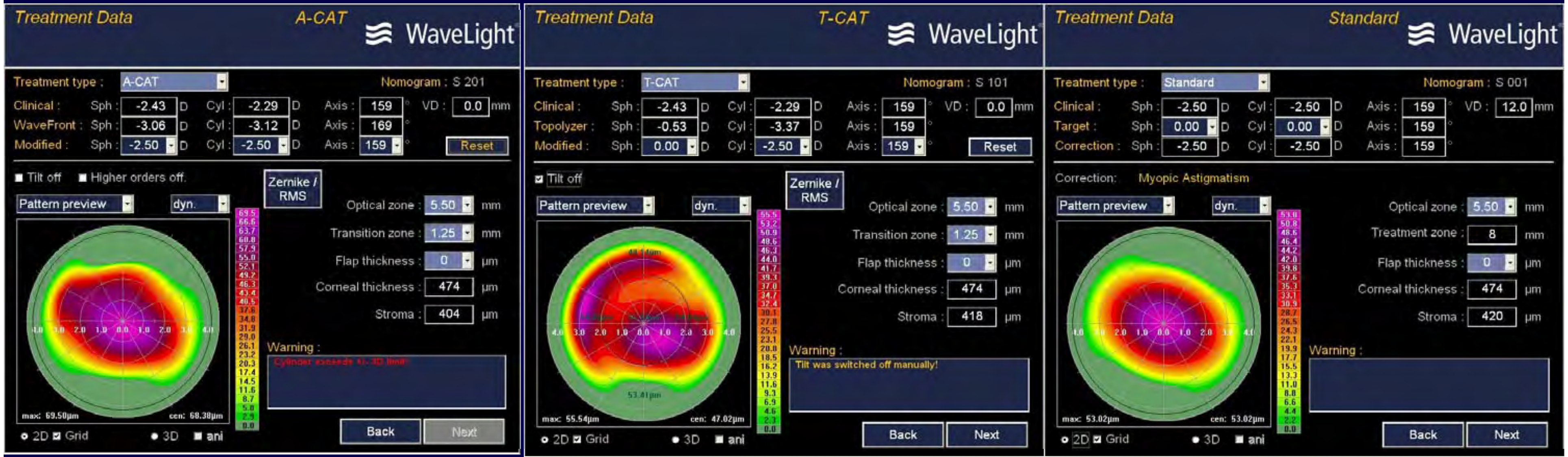


A failed INTACS KCN pt 20/70 to 20/15!



Kanellopoulos, MD www.brilliantvision.com

Alternative treatments

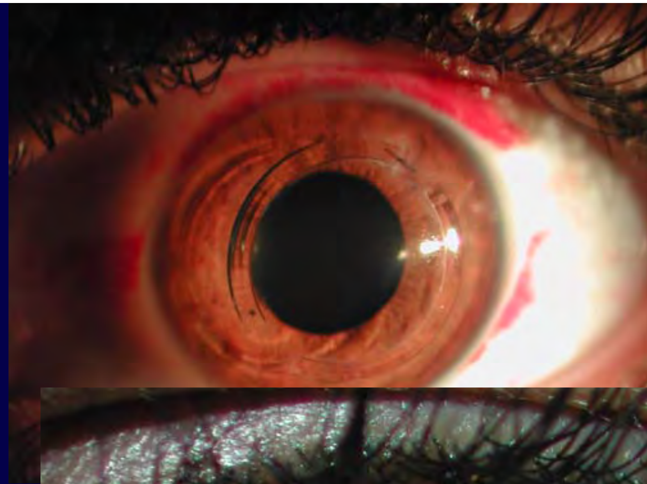


- Wave 70m topo 40 m standard 60 m

Kanellopoulos, MD www.brilliantvision.com

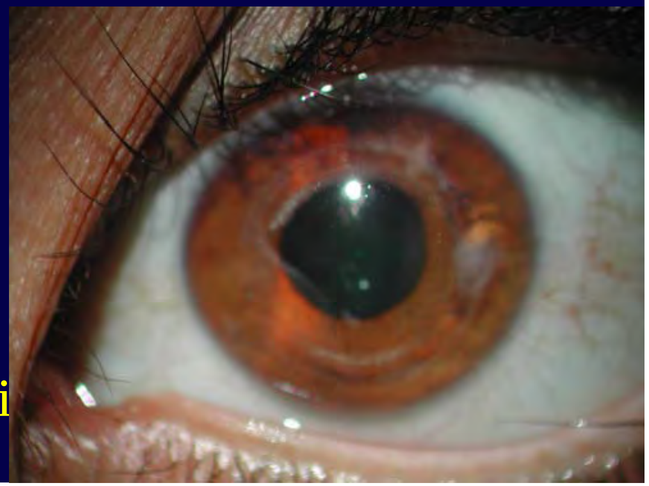
Same pt

Just after
INTACS



Lower INTACS
Segment extruded

INTACS out
6 m after CCL
3 months after tPRK



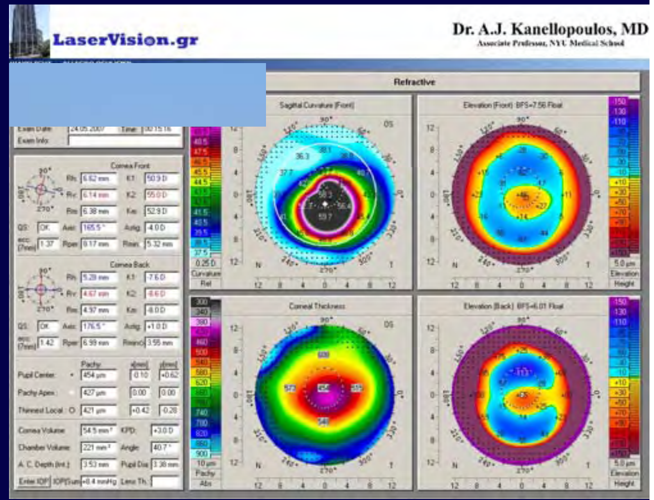
An argument against PK:

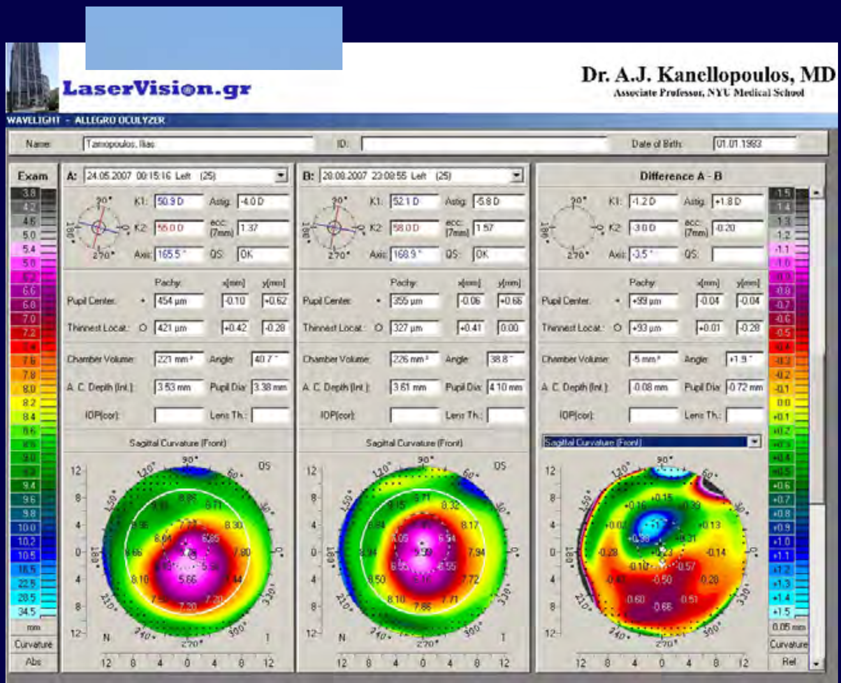
Pre: UCVA: CF

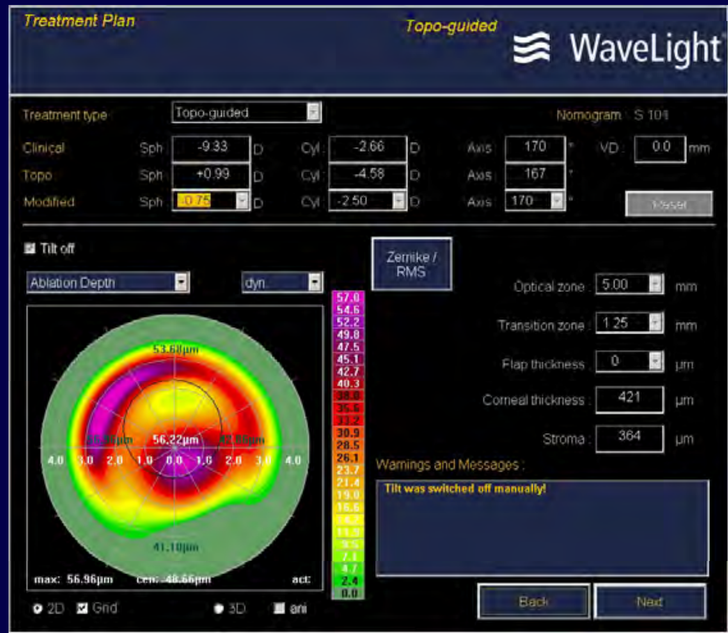
-10.50 -3.5 X170 20/50

Post: UCVA 20/400

-9 -1.50 X75 20/25 uses SCL -7D



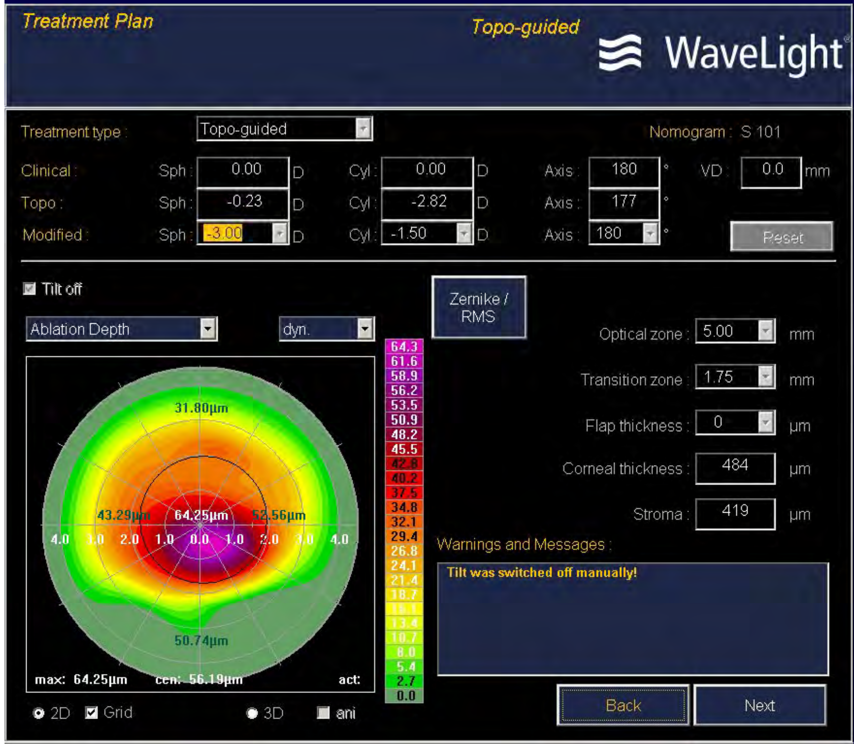




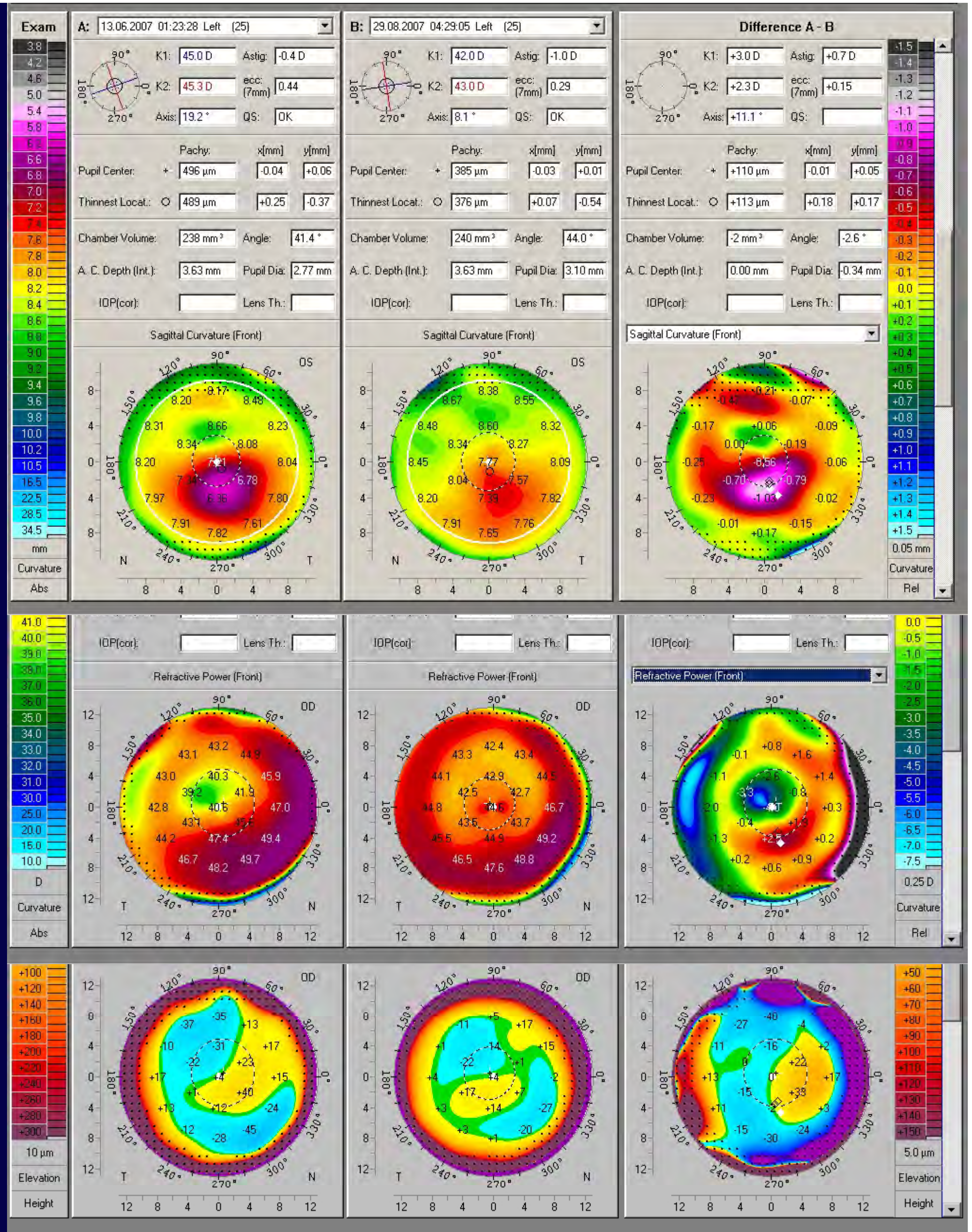
Kanellopoulos, MD www.brilliantvision.com

The 24 y/o ectasia example
Pre: UCVA 20/200
-4.5 -1.50 X 180 20/30
4 months post combined PRK and CCL:

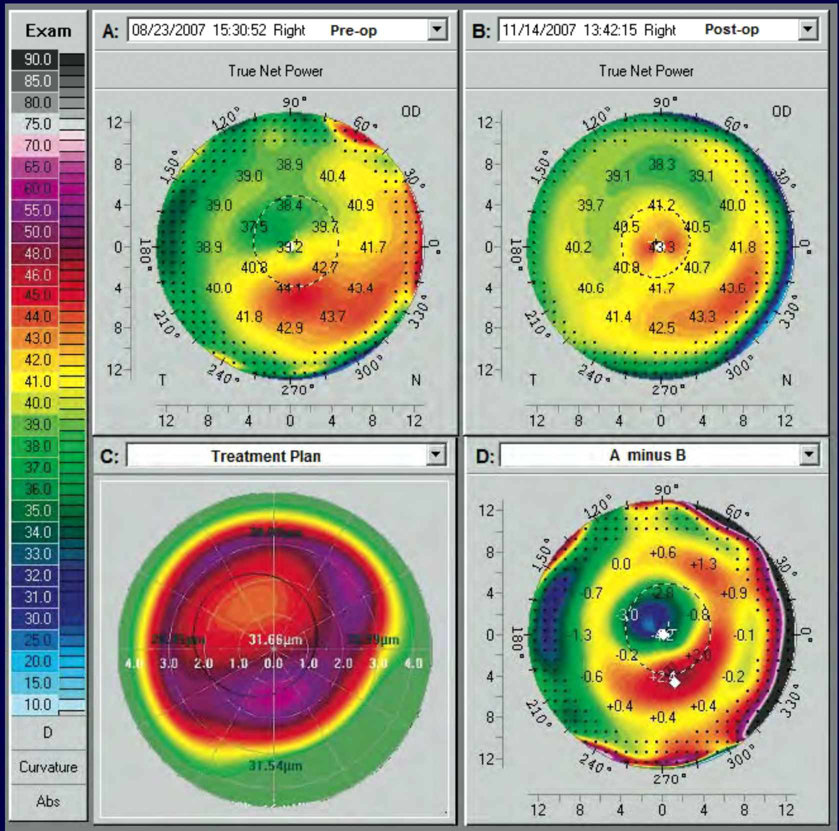
UCVA 20/25 -0.75 -0.75 X34 20/20

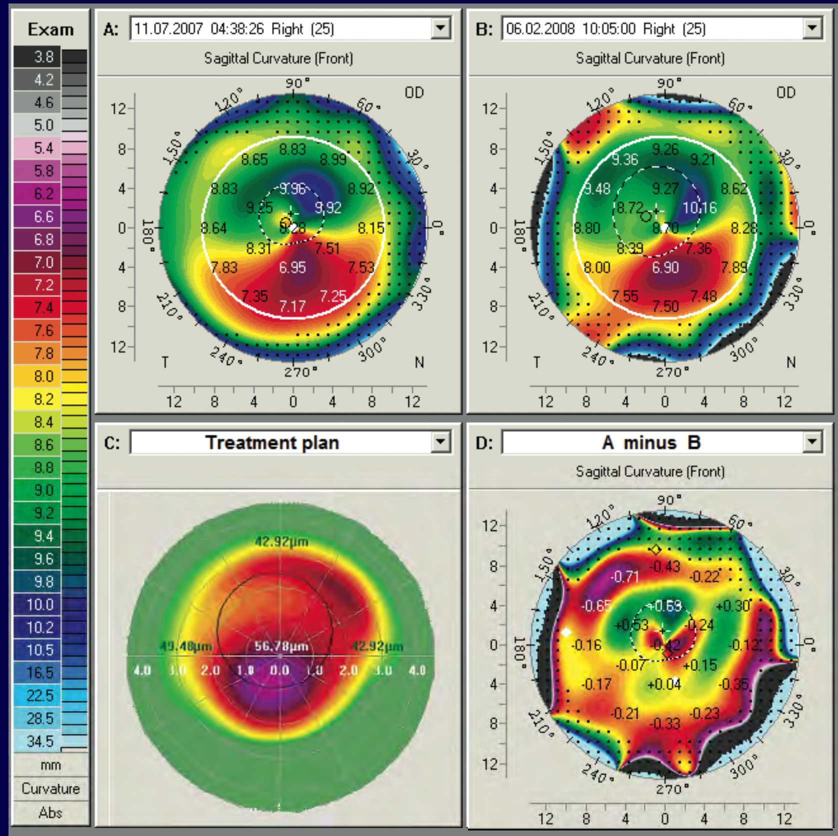


Topo-guided plan

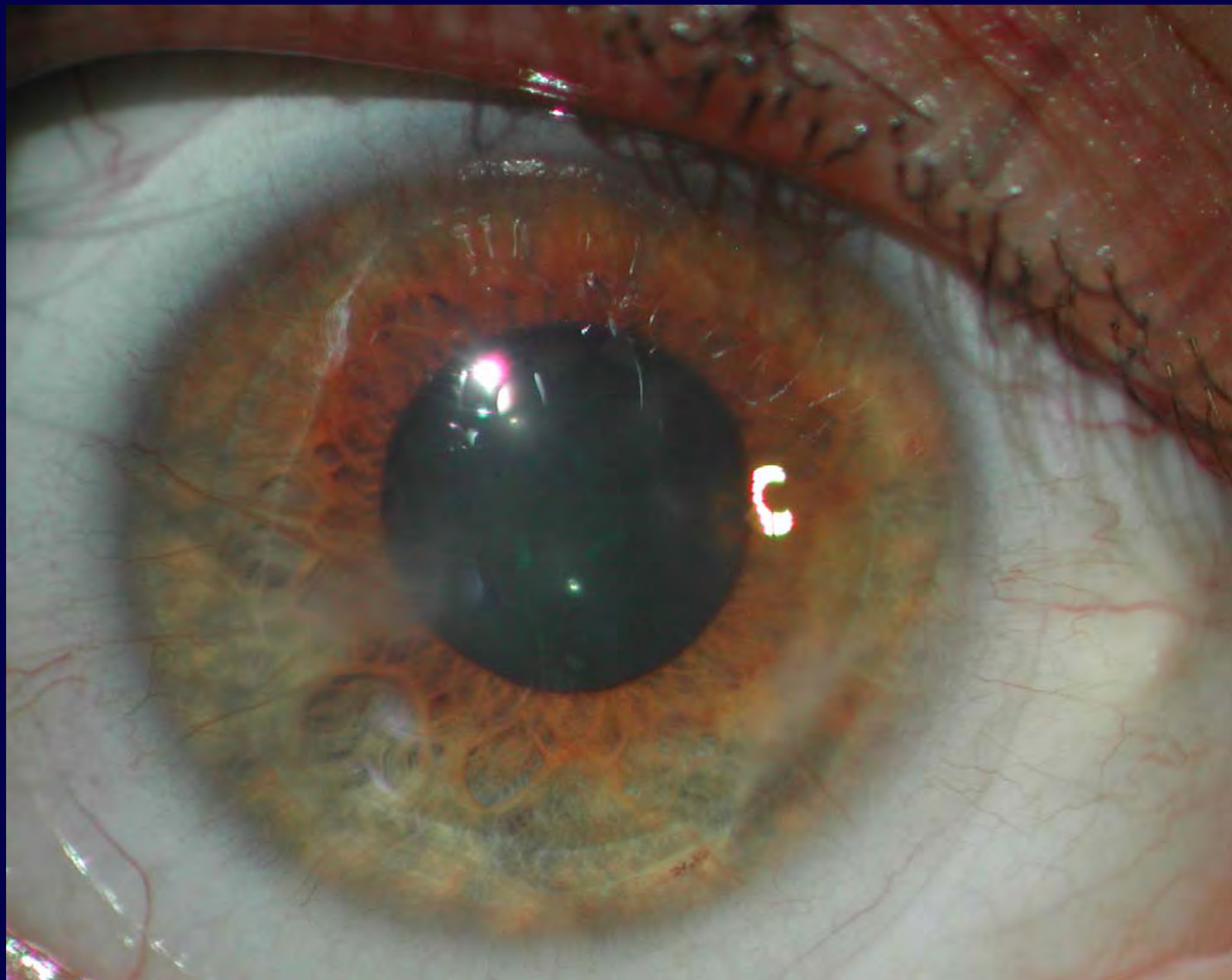


Case examples treating ectasia topo-guided PRK and CCL

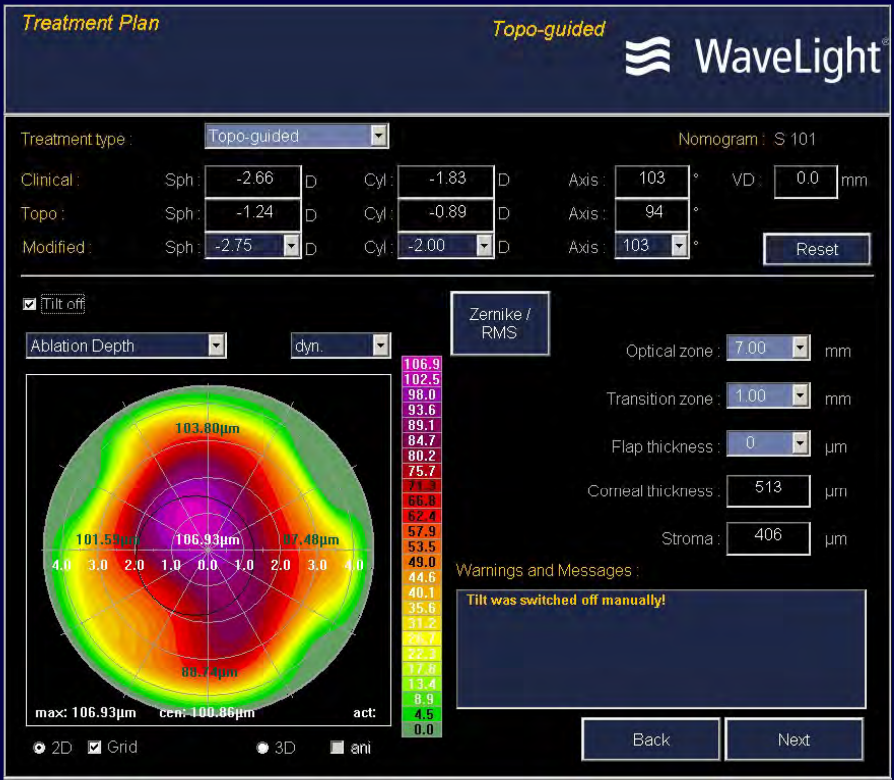


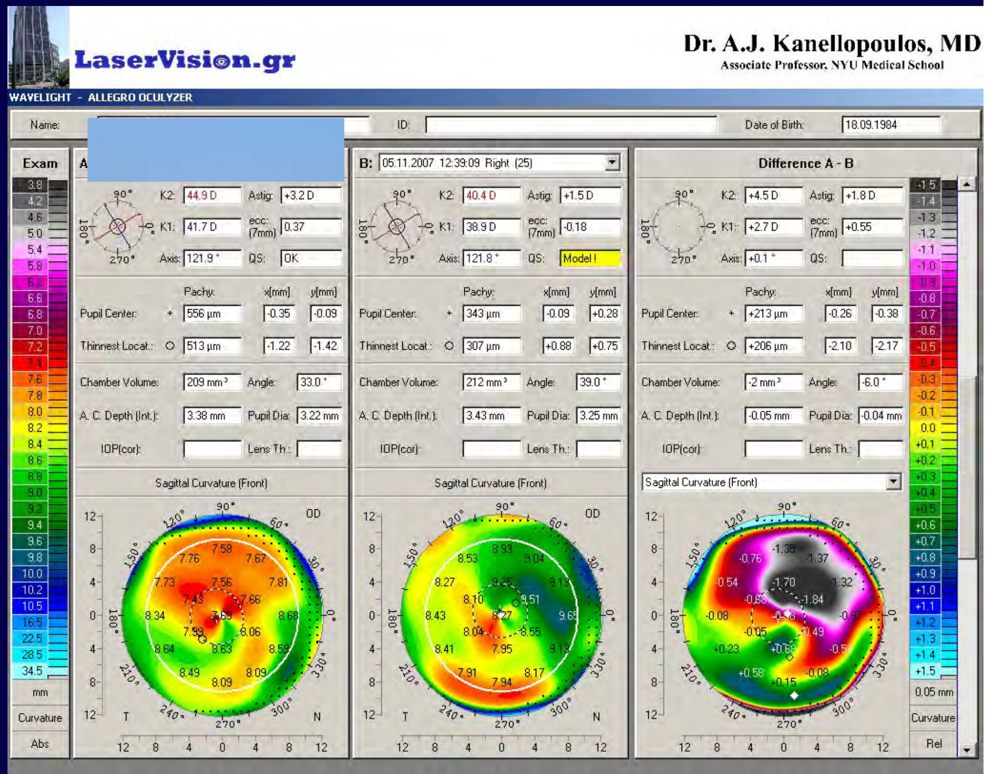


CL related scar and vascularization BSCVA: 20/100



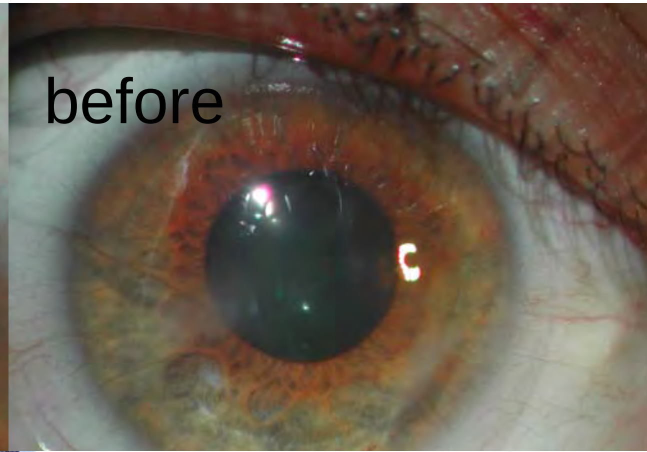
Pentacam-driven PRK and CCL 0.1% riboflavin + 7mW/cm2 X 15minutes

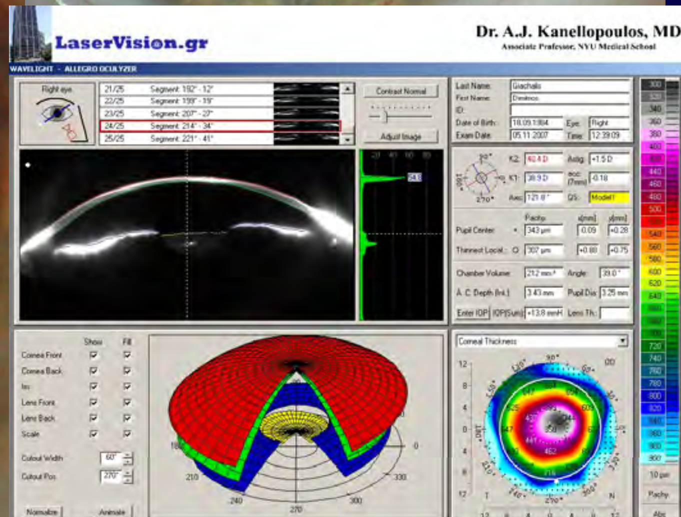


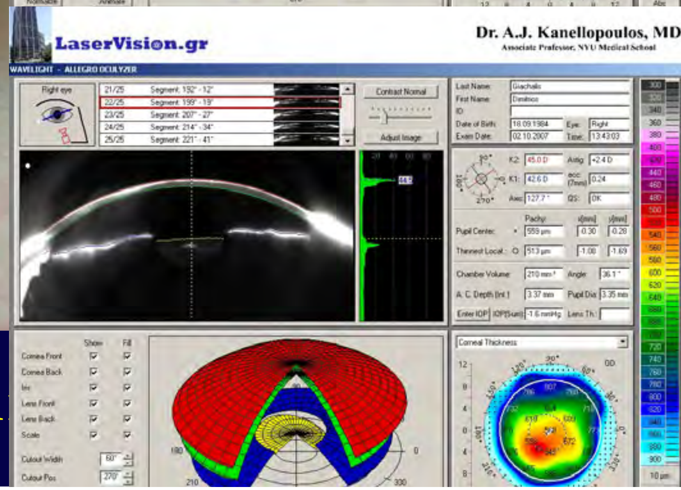


Kanellopoulos, MD www.brilliantvision.com


Post topo-guided PRK and CCL


before


LaserVision.gr
Dr. A.J. Kanellopoulos, MD
Associate Professor, NYU Medical School
WAVELIGHT - ALLEGRO OCULYZER


LaserVision.gr
Dr. A.J. Kanellopoulos, MD
Associate Professor, NYU Medical School
WAVELIGHT - ALLEGRO OCULYZER

Summary

Customised ablations today offer the option to treat extreme primary and surgery-induced irregularities

All custom treatments aim for a better wavefront

Wavefront-guided may pose difficulties in registration variability and tissue demands

Topography and Pentacam have been very reliable in minimizing severe cornea distortions

They offer reliable registration on more cases.

They may require surgeon nomogram-manipulation in order to adjust sphere.

Summary /Collagen cross linking

- CCL effective stabilization in iatrogenic ectasia and keratoconus
- Technology and technique evolving as Riboflavin is the activating element, the “shield” to the underling tissue but also the potential hazard
- May reduce the number of transplants for keratoconus (by 70% in my practice)

My current practice

- **Myopia:** 85% F-CAT with the Eye-Q, 400Hz, (Q-value adjustment customised treatment)

  RMSH>0.4 Wavefront-guided

  High cylinder: topo-guided

•**Hyperopia:** 100% Oculyzer (pentacam)-guided with q-value adjustment (adjust for angle kappa)

•**Enhancements:** 100% customised (wavefront or usually topo-guided)

Thank you

www.brilliantvision.com