

Cornea Scars? What's Better?
Penetrating Keratoplasty (PK) or
Deep Anterior Lamellar Keratoplasty (DALK)

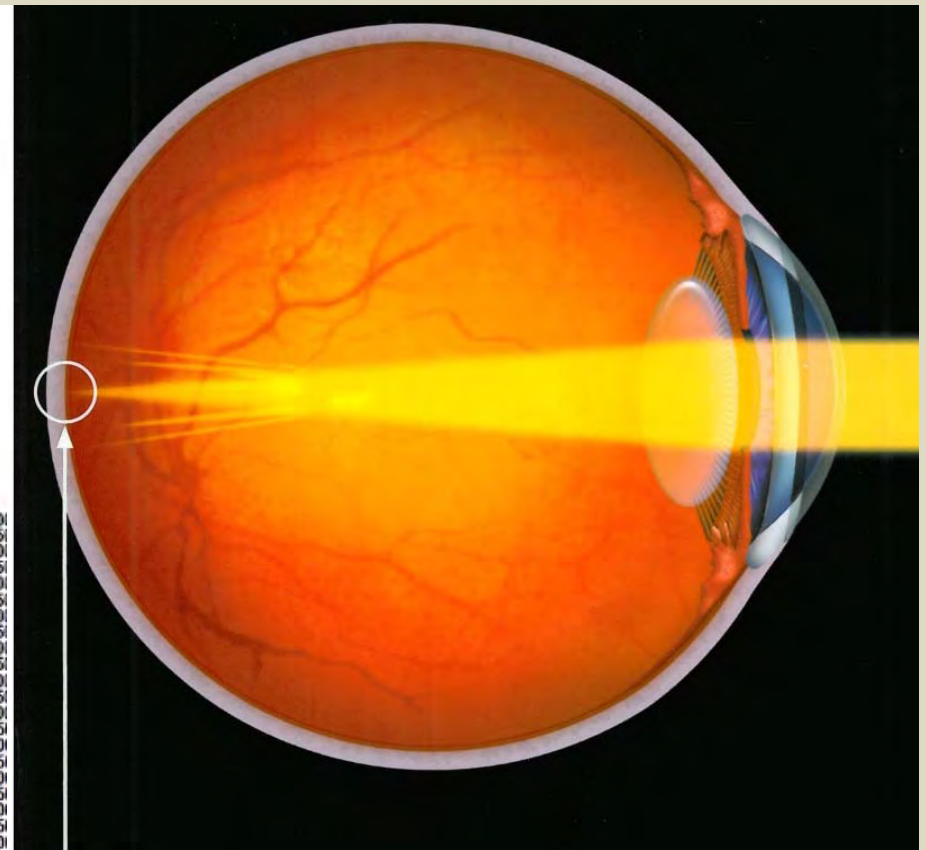
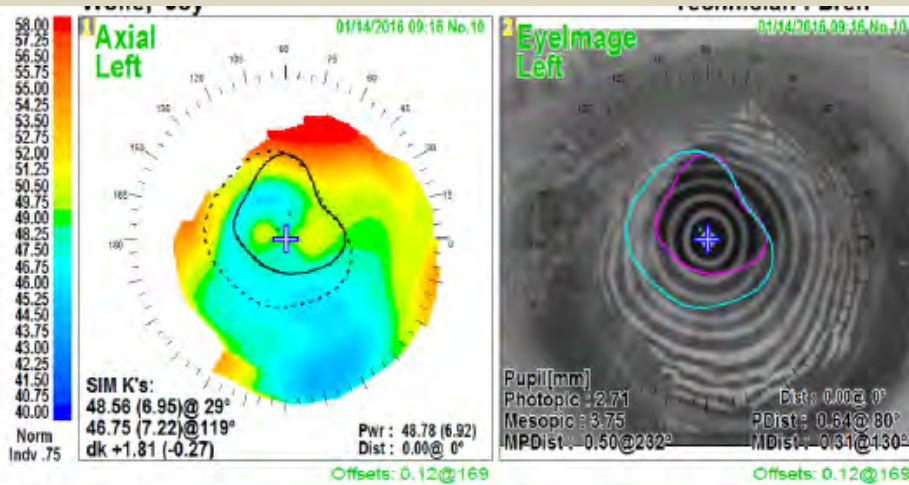


Case Reports:

Penetrating Keratoplasty (PK) for Cornea Scars

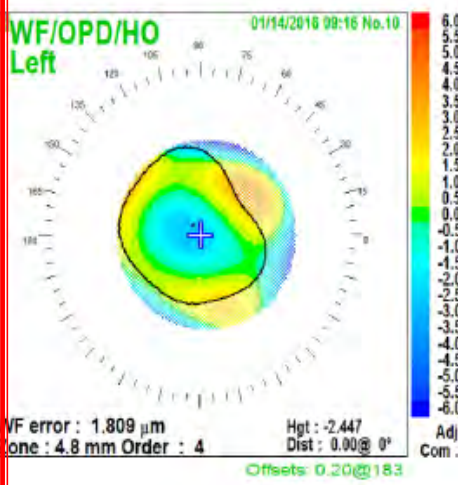
- 2 eyes

Case 1: OS: Cornea Scar 1.5 yr post-op PK
 8.25 mm dia., suture out -3.5+2.25x39 20/25
 cornea aberration profile: high! Long term: Graft rejection and if not,
 cornea endothelial exhaustion may risk eventual graft replacement



3. Zernike/Corn No.10 Left Zone : 6.0 Order : 4

V.Sets	0.00	0.20	0.40	0.60	0.80
Total					11.355
Tilt(S1)					7.202
High					8.110
T.Coma					2.492
T.Trefoil					1.345
T.4Foil					3.917
T.Sph					0.911
HiAstig					6.448



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Case #2 OD

77 yo cornea scar OD

PK 2004, repeated d/t graft failure PK 2011, rotated graft 2015

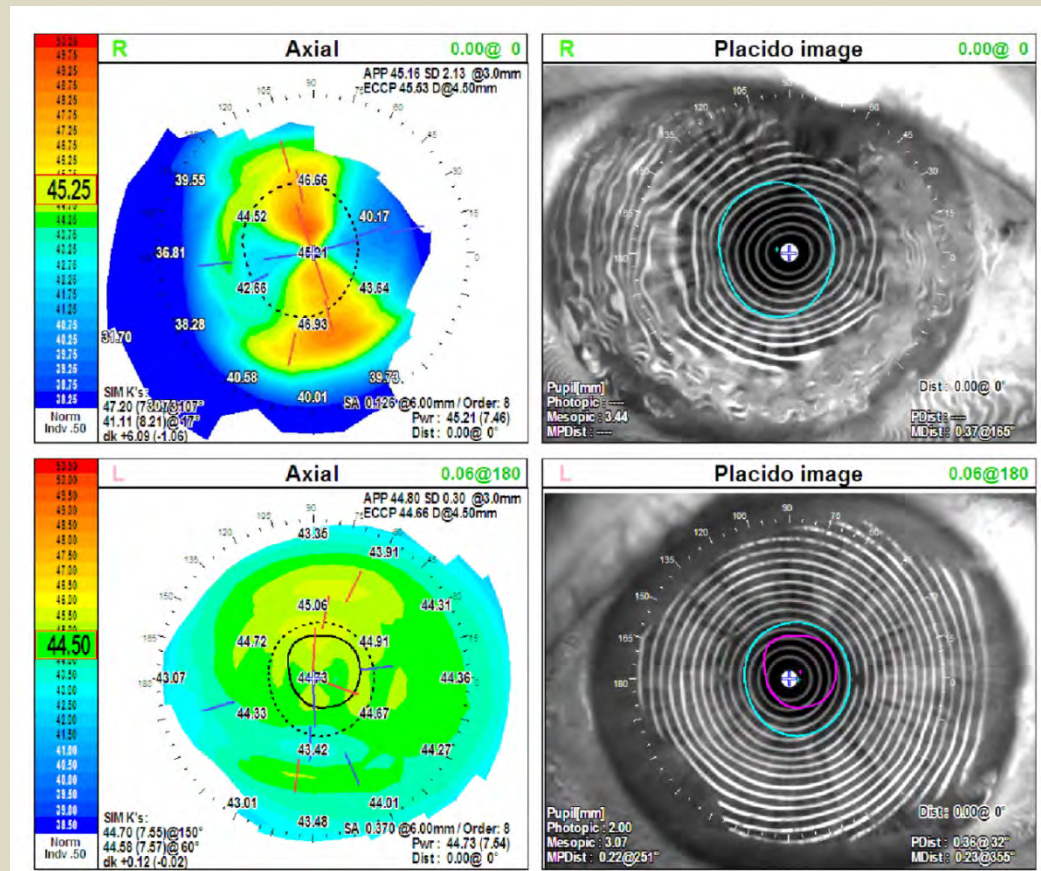
d/t high magnitude irregular astigmatism

OD cataract/IOL surg 2015

OD -1.5+4.0x100 20/25

OS +1.0

20/20



Case Reports: PK for Cornea Scars problems (vs large diameter DALK):

- Irregular astigmatism
- Higher cylinder magnitude
- Higher corneal aberrations than large dia DALK
- Long term graft rejection – increased further if bed vascularized – graft failure
- Long term endothelial cell exhaustion – graft failure
- PK cornea grafts do NOT generally last a lifetime and if live long enough, need replaced
- Glaucoma

Case reports:
Deep Anterior Lamellar Keratoplasty (DALK)
for Cornea Scars

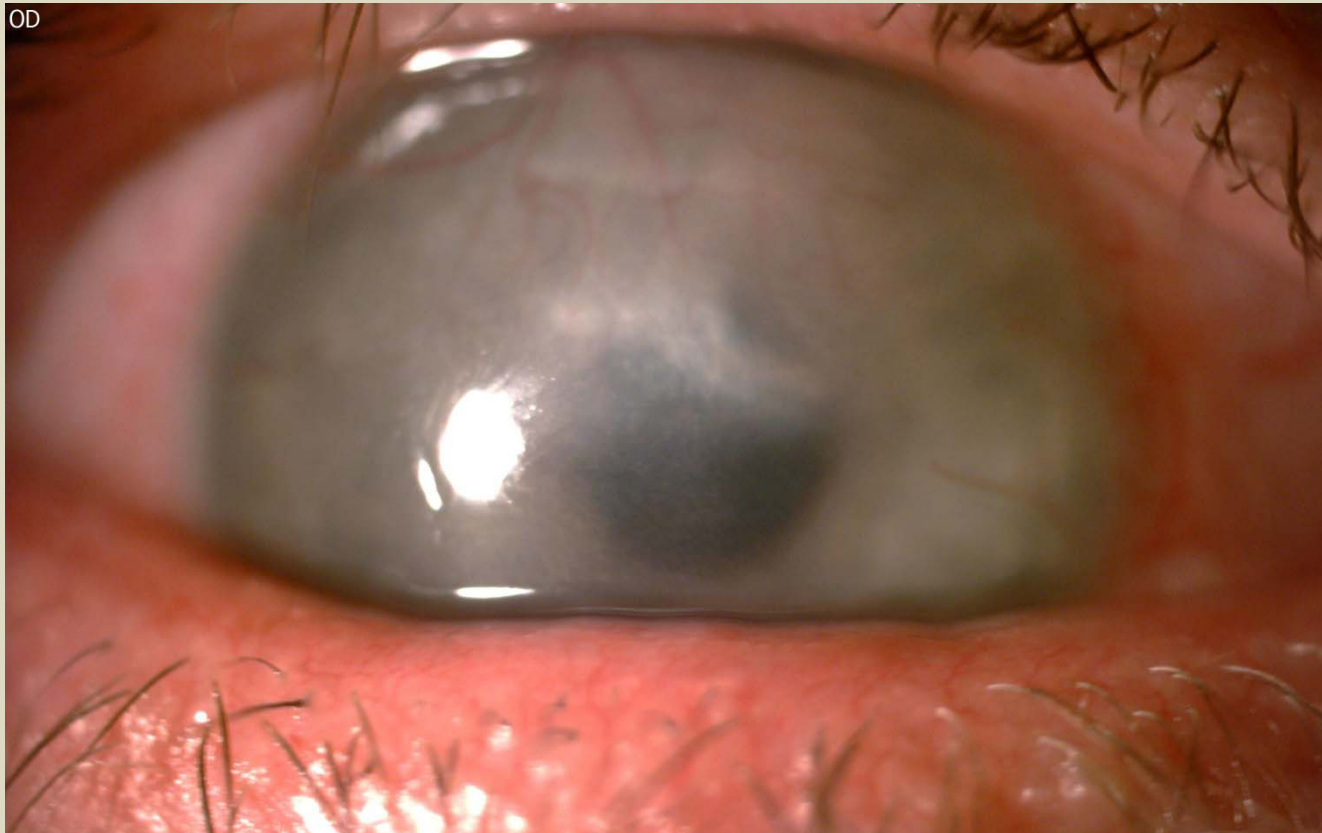
7 eyes of 6 patients

Up to 9 years post-op

Case #1 OD

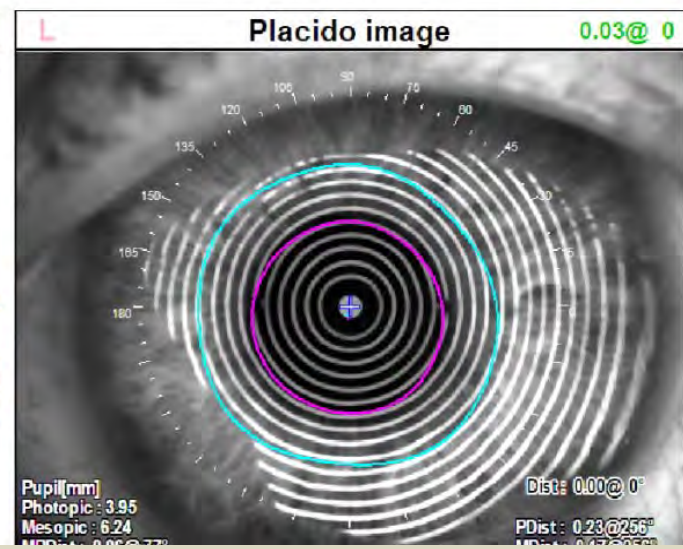
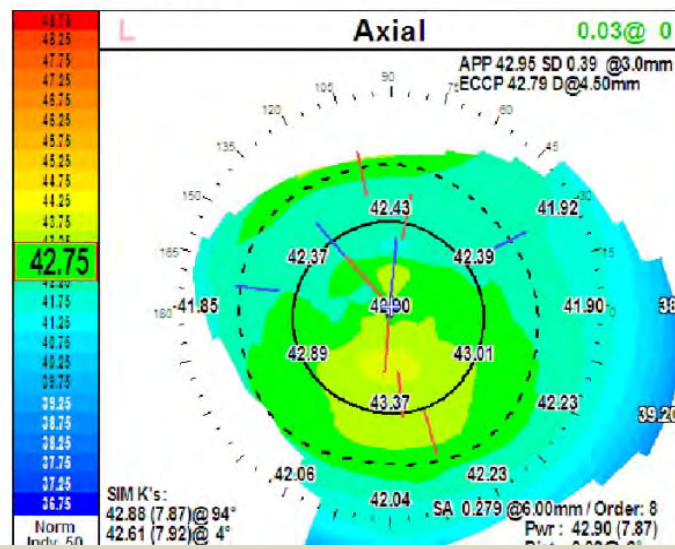
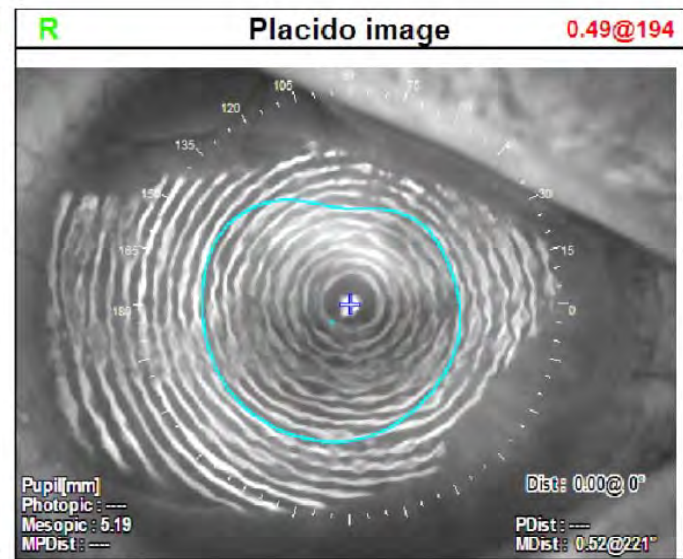
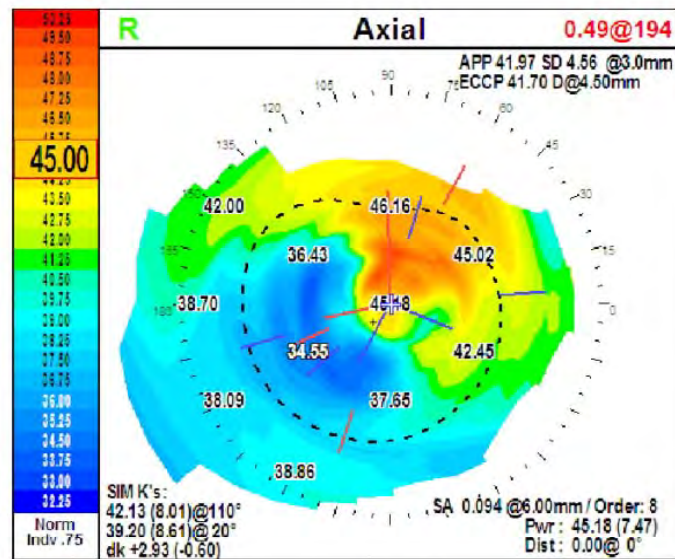
51 yo Cornea scar / Herpes Zoster (HZV)

Best Corrected VA 20/100



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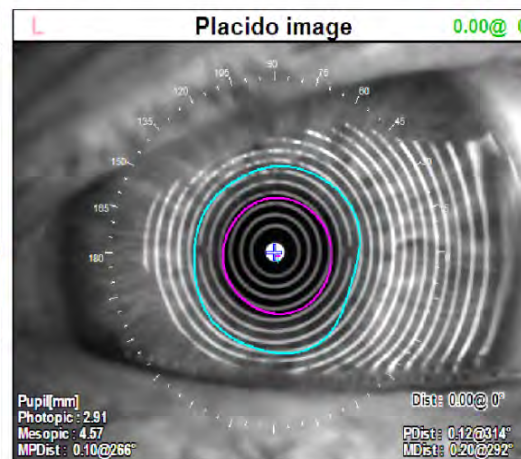
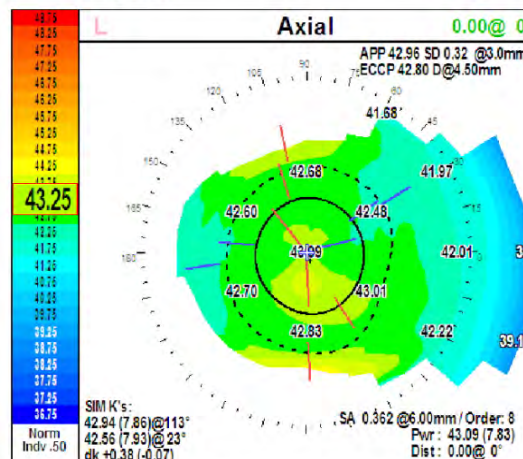
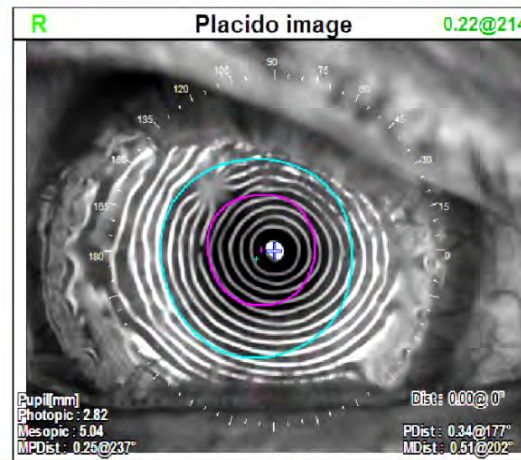
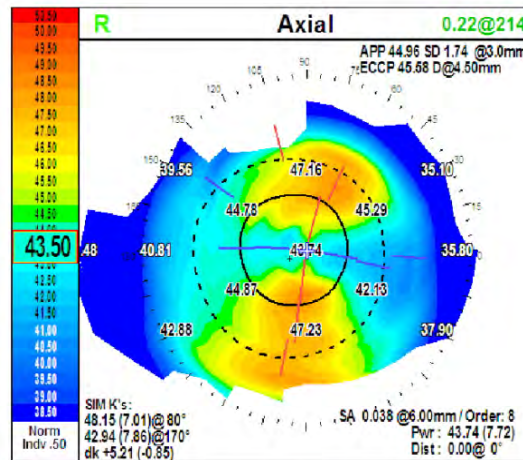
Case #1 Cornea scar / HZV OD



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Case: #1: OD: Cornea Restoration d/t Cornea scar / HSV
 2/11/19 Topography below: Rx: 3.25 + 4.25 x 65 20/40
 11/27/18 DALK 9.0mm

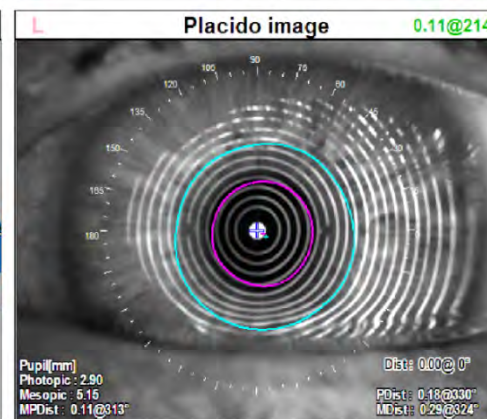
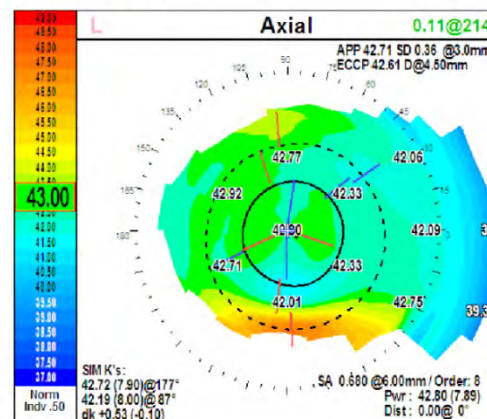
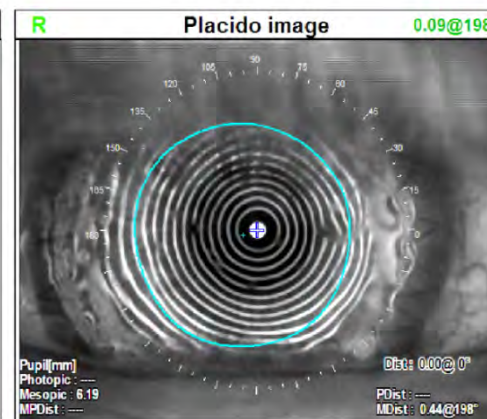
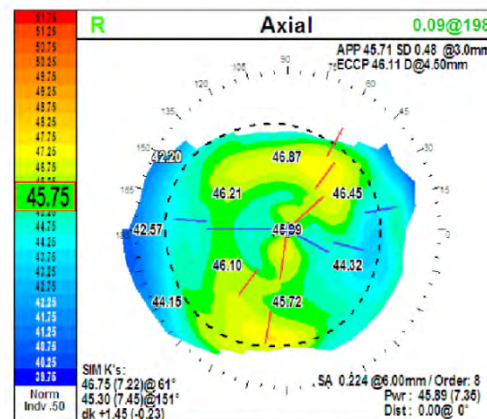
02/11/2019 07:48		L		Diagnosis	L
02/11/2019 07:47	Comment	R			R



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Case: #1: OD: Cornea Restoration d/t Cornea scar / HSV
 03/11/2019 (topo below) -4.0+1.25x70 20/25
 02/26/2019 Adjust running cornea suture under
 intraoperative keratometer goal: reduce astigmatism
 11/27/2018 DALK 9.0mm

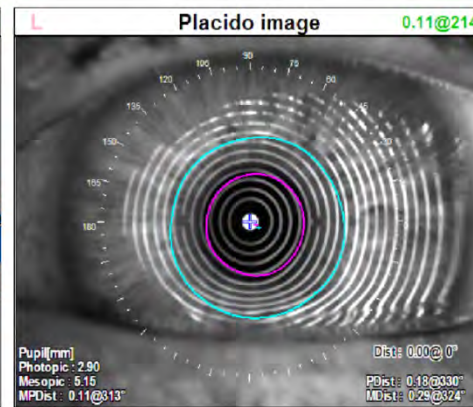
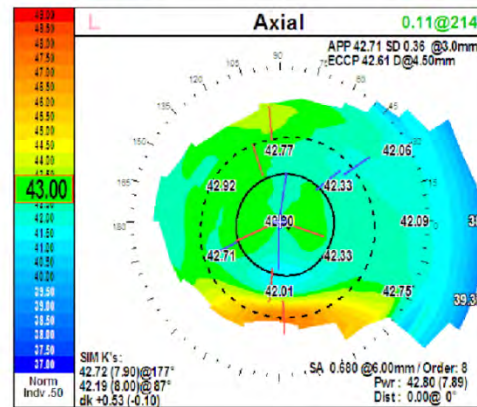
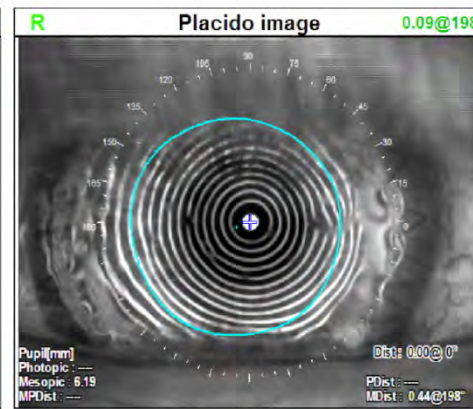
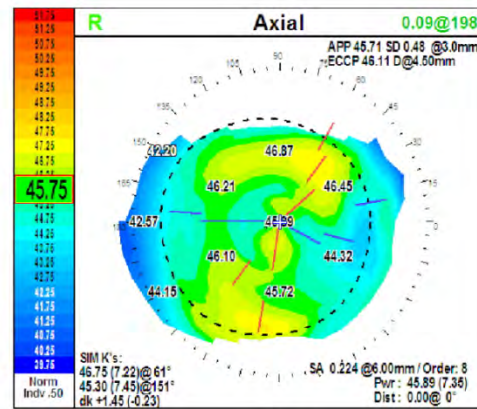
L	03/11/2019 15:43	Comment	L	Diagnosis	L
R	03/11/2019 15:43		R		R



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Case: #1: OD: Cornea Restoration d/t Cornea scar / HZV
 9/1/2021 -2.0+0.5x163 20/25
 8/11/2021 Remove Running cornea graft suture
 03/11/2019 -4.0+1.25x70 20/25
 11/27/2018 DALK 9.0mm

L	03/11/2019 15:43	Comment	L		Diagnosis	L	
R	03/11/2019 15:43		R			R	



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Case: #1: OD: Cornea Restoration d/t Cornea scar / HSV

9/7/2022 Topo below, Refx no change

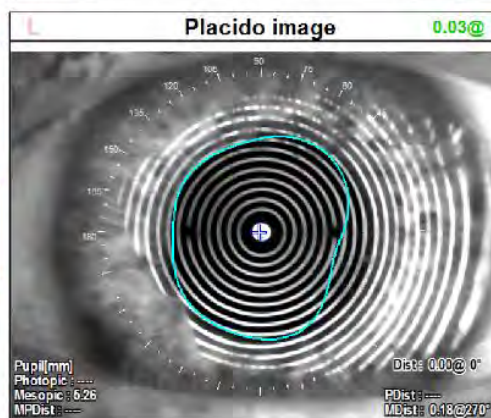
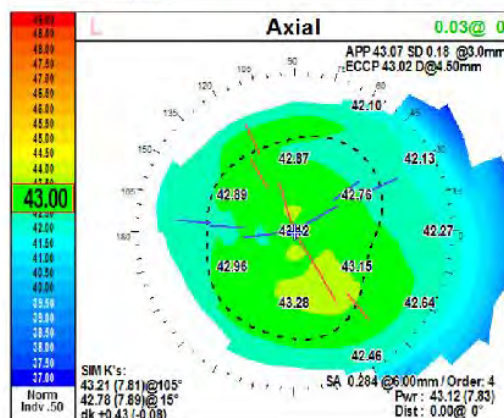
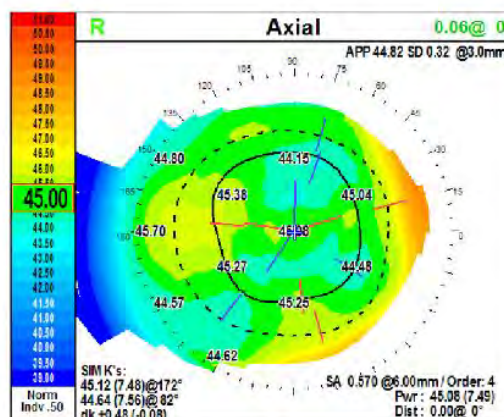
9/1/2021 -2.0+0.5x163 20/25

8/11/2021 Remove Running cornea graft suture

03/11/2019 -4.0+1.25x70 20/25

11/27/2018 DALK 9.0mm

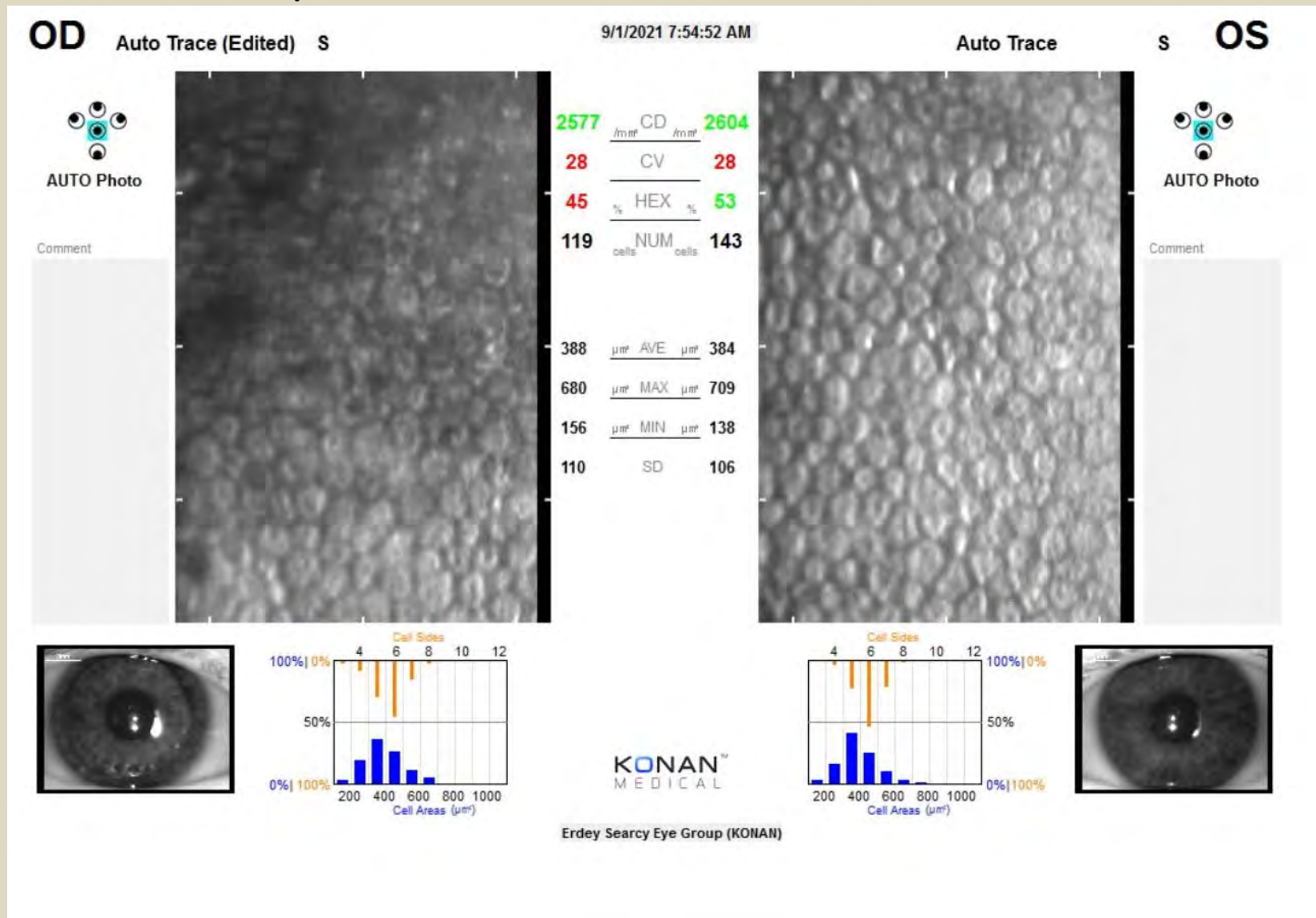
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R	09/07/2022 07:43		R			R	



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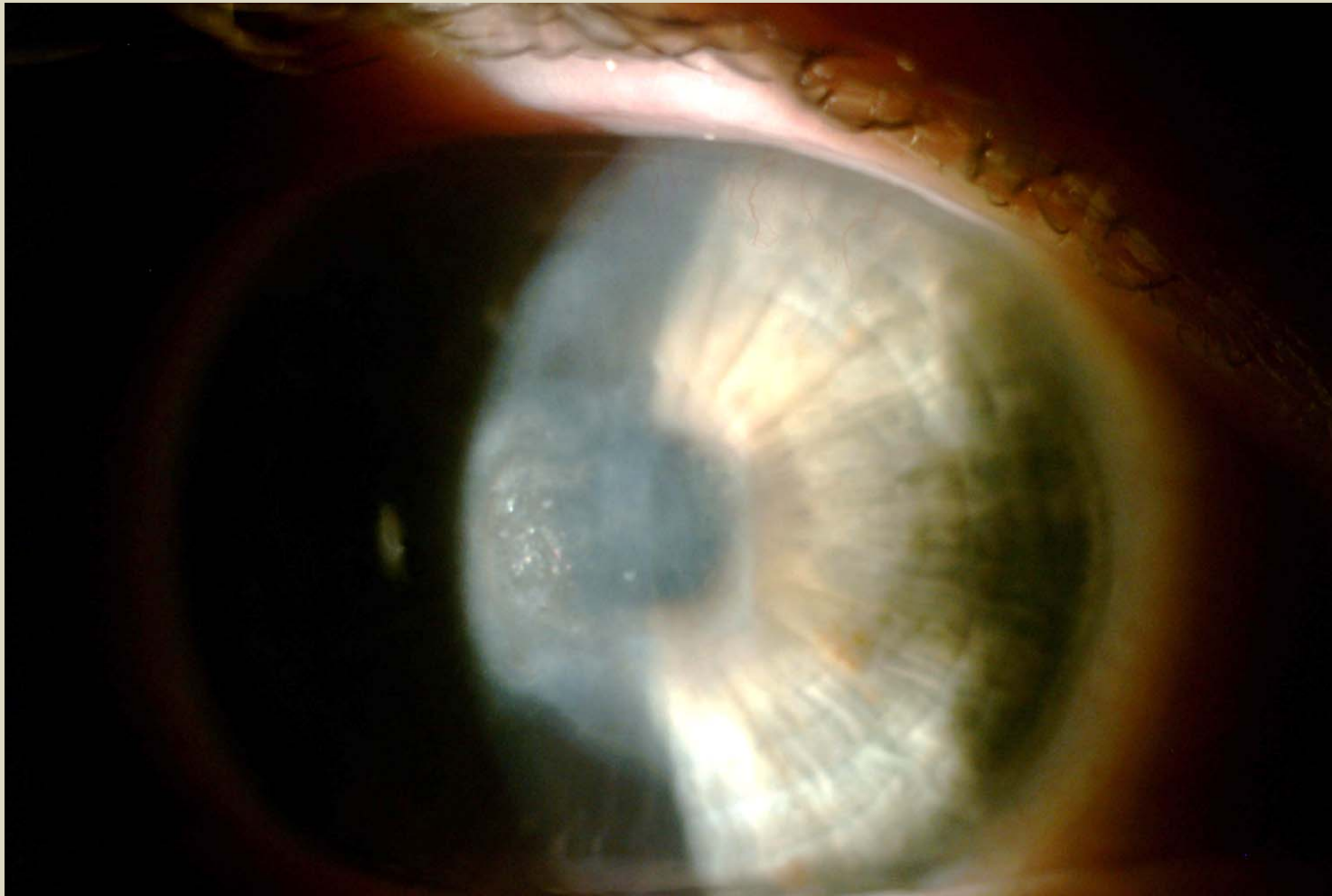
Case # 1 OD: Endothelial Cell Count 9/21/2021

Note: NORMAL endothelial cell count as expected Why? Because Endothelial cells/Descemet's membrane RETAINED with DALK



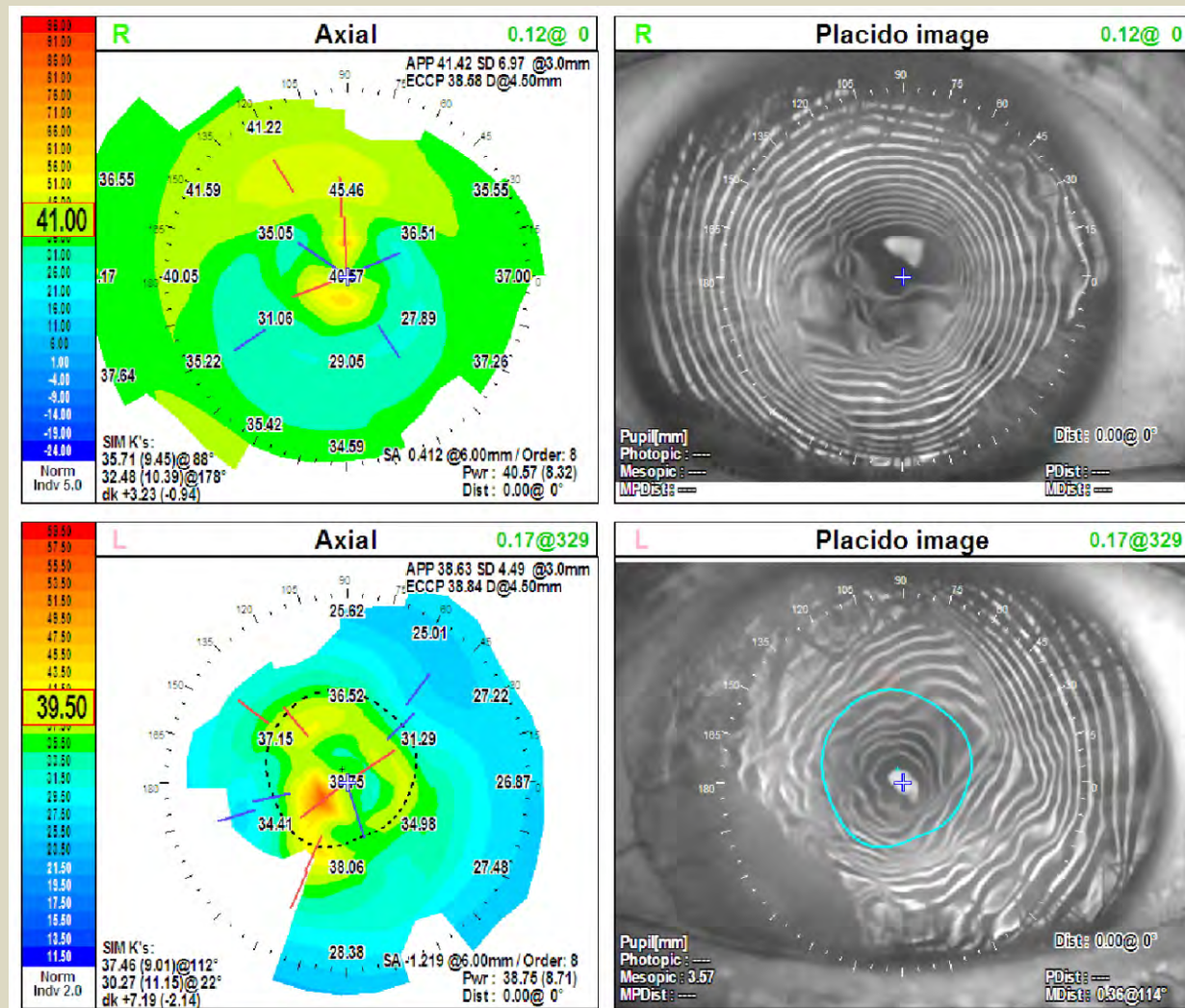
CASE #2 OU

57 yo FM Bilateral Central Thinning and severe cornea
scar /Herpes Simplex Virus (HSV) 1982
BSCVA 20/400 EACH EYE! Disabled since age 21!



CASE #2 Bilateral Central Corneal Scars

Disabled since age 21!

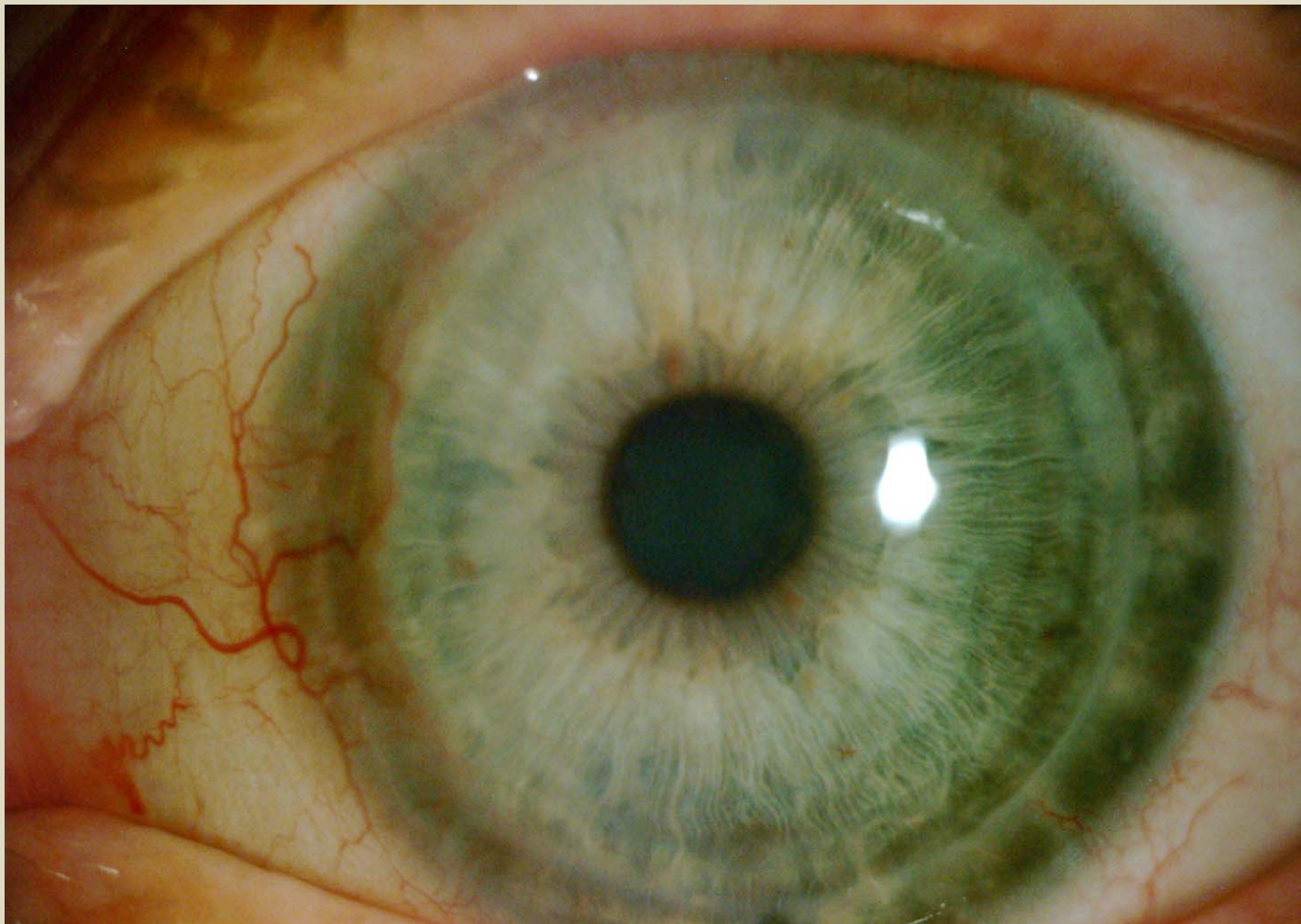


Case #2

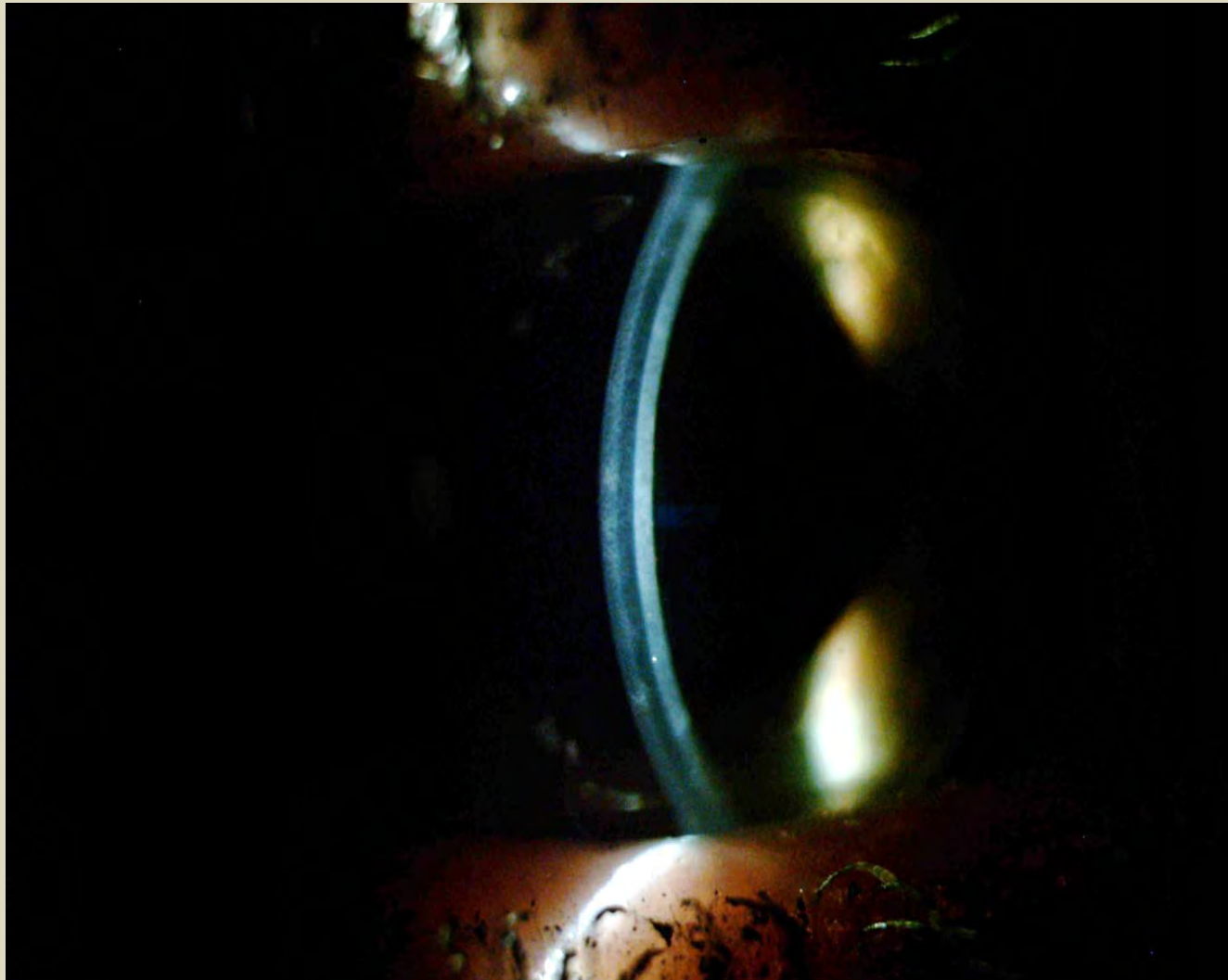
Bilateral Central Thinning Cornea Scar/HSV since age 21

3/2019 OS Uncorrected VA 20/50 note nasal deep neovascularization in host bed. If this graft was a PK, this finding would dramatically increase chance of endothelial graft rejection and decompensation = failed graft...cannot happen with DALK!

8/2018 OS DALK 9.0mm



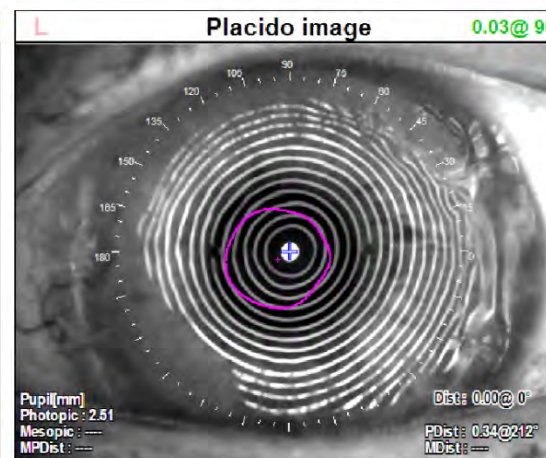
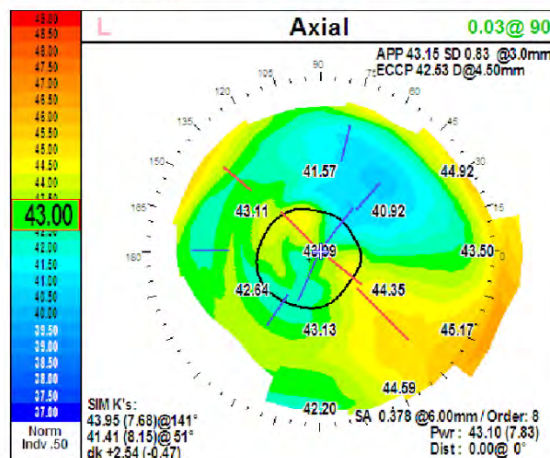
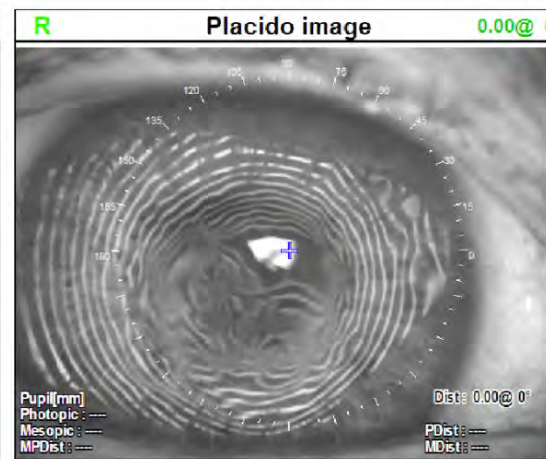
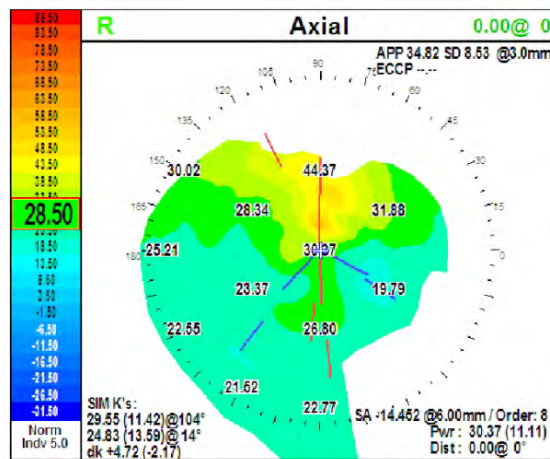
Case #2 Bilateral Central Thinning Cornea Scar/HSV
3/2019 OS UCVA 20/50 mild residual haze Descemet's
Membrane/Endothelial layer preferable to sacrificing it as would w PK!
8/2018 DALK OS



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Case #2 Bilateral Central Thinning Cornea Scar/HSV
 3/2019 OS suture out UCVA 20/50 - Right eye: DALK not done yet...
 8/2018 OS DALK 9.0mm

03/06/2019 13:52	Comment	L	Diagnosis	L
03/06/2019 13:52		R		R



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Case #2: Bilateral Central Scars (since age 21)

8/2019 Topo Below:

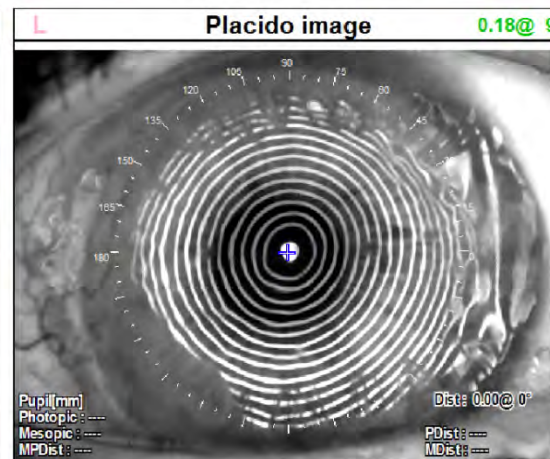
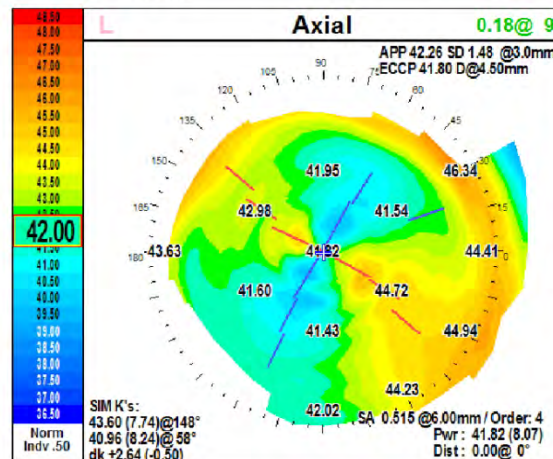
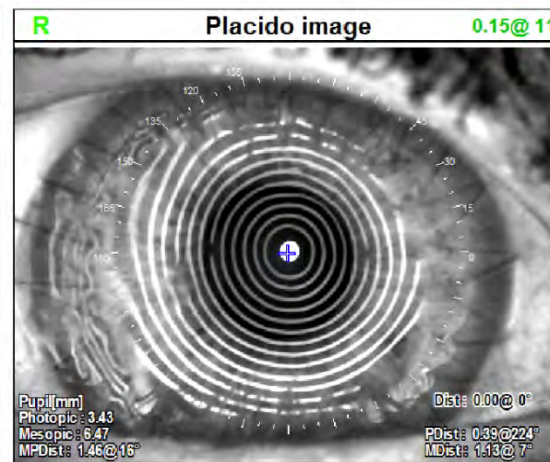
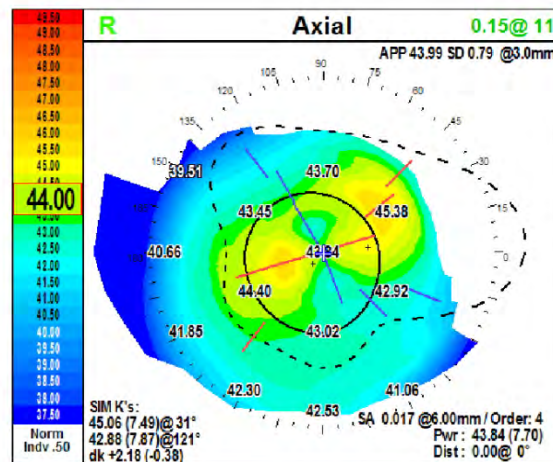
Refraction: OD -1.0+1.75x30 20/30 OS plano+1.75x150 20/40

Very rapid Corneal Restoration/visual rehabilitation OU with DALK (vs PK) !!

OD 4/2019 DALK 9.5mm

OS 8/2018 DALK 9.0mm

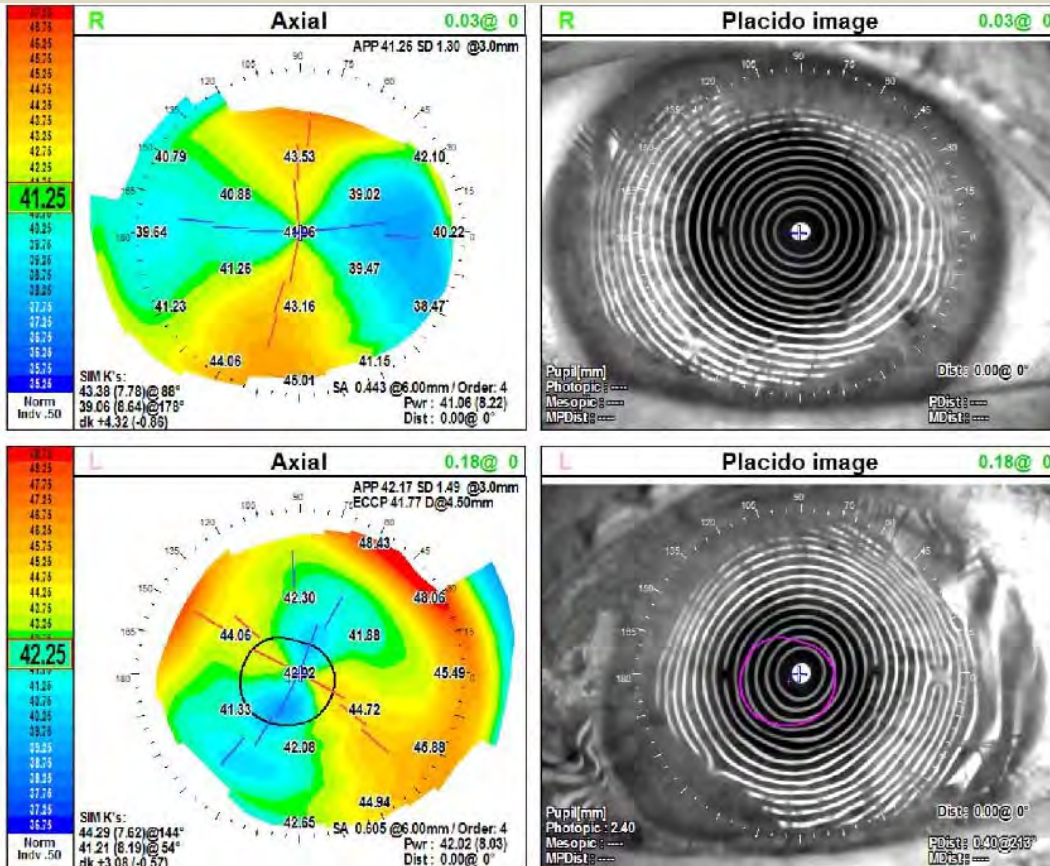
L	08/22/2019 10:22	Comment	L	Diagnosis	L
R	08/22/2019 10:22		R		R



Case #2: Bilateral Central Scars (since age 21)

7/28/2021 – Massive visual improvement! -**VERY Happy** –
“Life Changing after 39yrs of visual disability” – (now age 60)

!



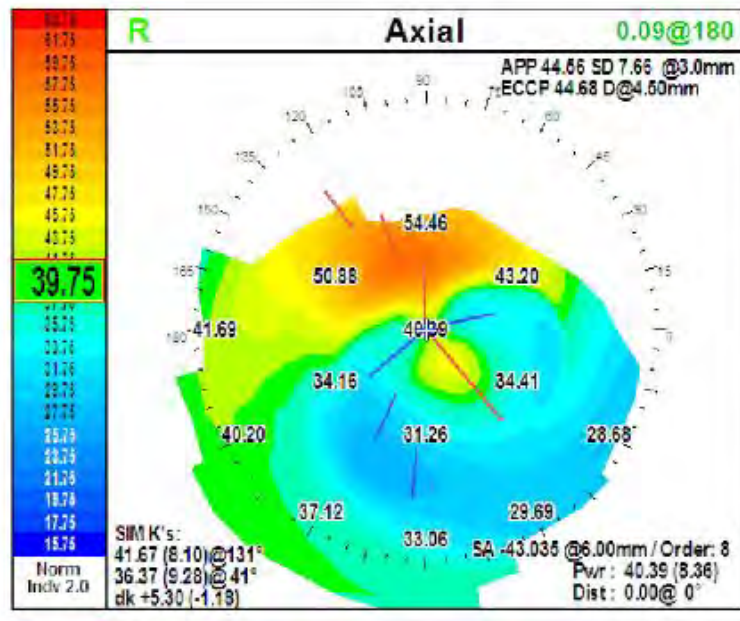
- OD: -0.25+3.5x90 20/30
 - (vs. pre-op 20/400!)
 - Running suture out x 1.75 yrs
 - Topography is STABLE and is expected to remain so for life! (unlike PK)
 - Future: reduce/eliminate cylinder w cataract extraction w Toric IOL
-
- OS: -0.5+2.5x140 20/40
 - (vs. pre-op 20/400!)
 - Running suture out 2.5yrs
 - Topography is STABLE and is expected to remain so for life! (unlike PK)
 - Future: reduce/eliminate cylinder w cataract extraction w Toric IOL

Case 3: OD

70 yo woman Corneal Scar since 1943
(infectious ulcer)

Best Corrected VA 20/100

R 02/06/2019 13:01 R R



Case 3: OD

Cornea Scar since 1943: Cornea Restoration w large dia DALK

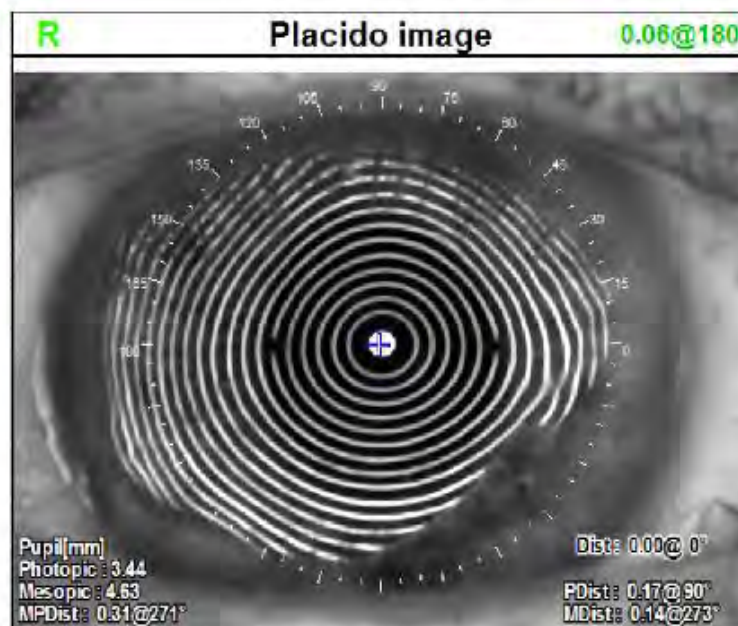
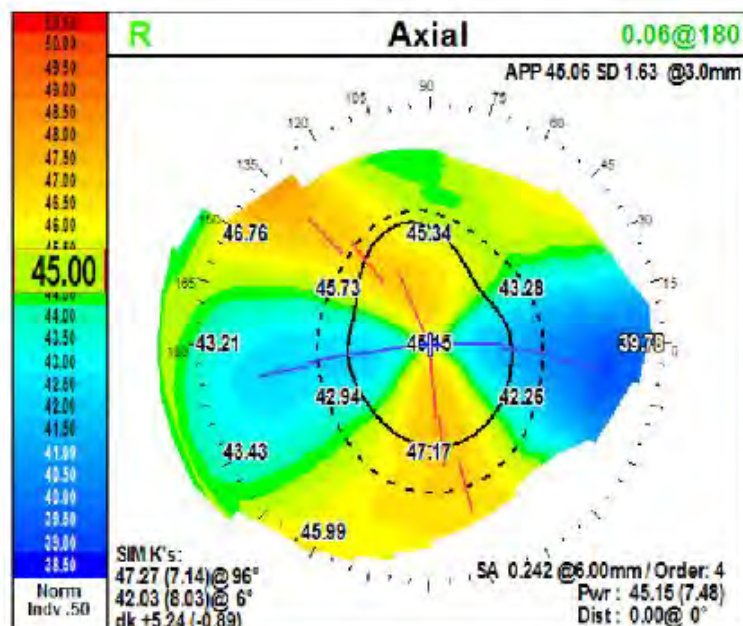
4/2022 TOPOGRAPHY (below) Refx: -1.25+0.25x150 20/30+ **“thrilled”!**

2/2020 optical “rescue” with Cat Ext w TORIC IOL AMO 600 15.5x90

12/2019 suture out

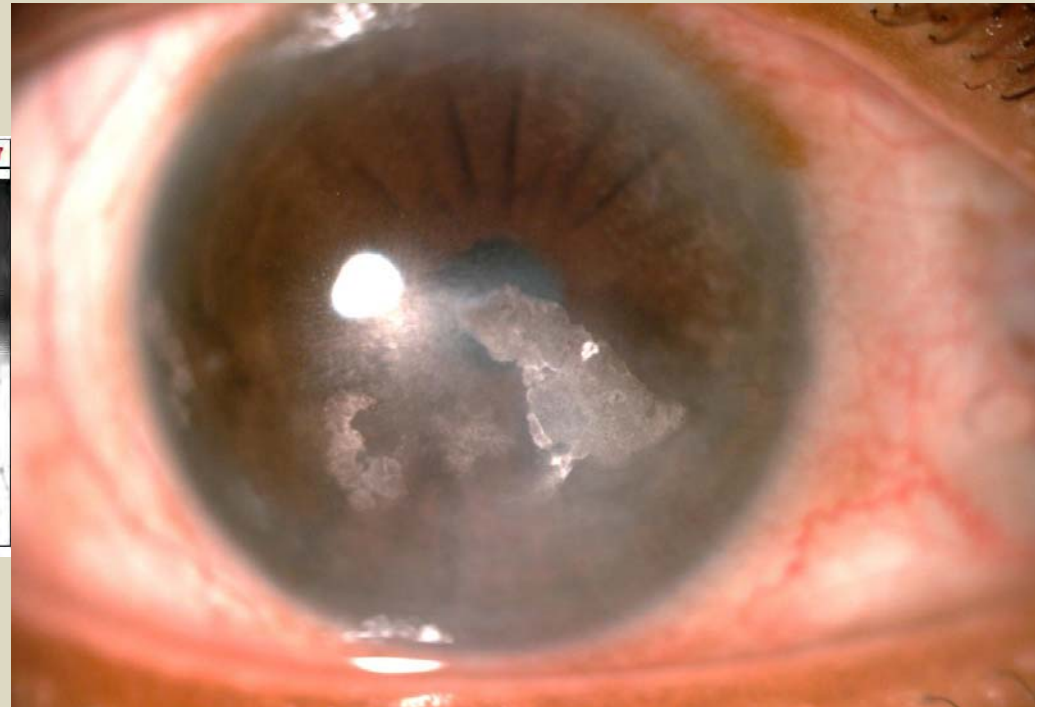
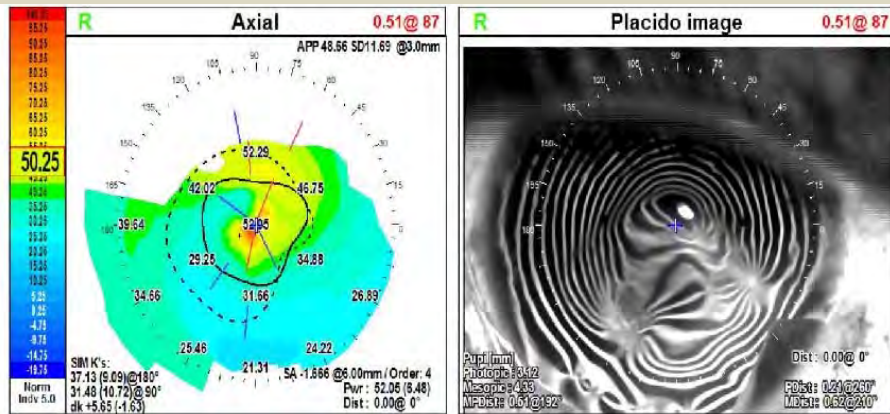
2/2019 DALK 9.5mm diameter

Date	Comment	Diagnosis
R 04/06/2022 12:38	R	R



Case # 4 OD

71 yo FM Corneal Scar – Band keratopathy – Failed keratectomy/chelation -12.0+7.25x135 20/100

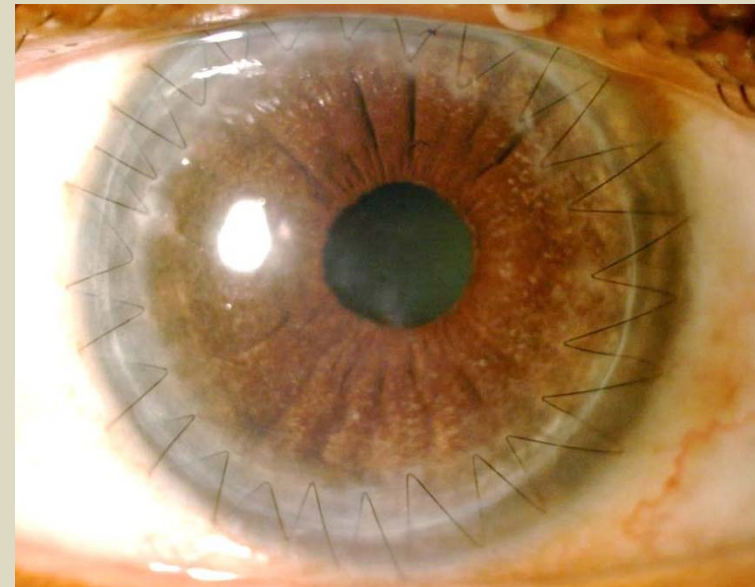
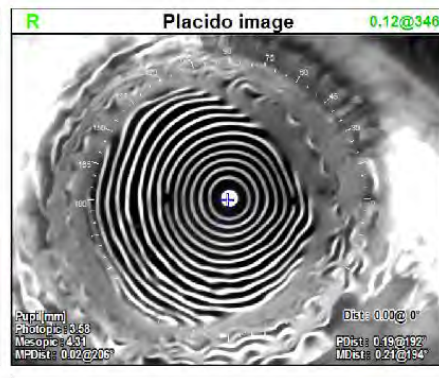
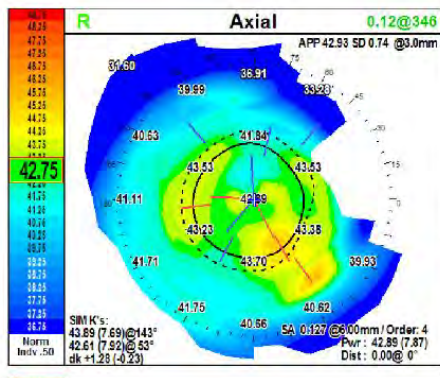


Case #4 OD

10/13/2021 Refx: -8.5 20/60

9/14/2021 DALK 9.0mm

R	10/13/2021 08:46	Comment	R		Diagnosis	R	
L	10/13/2021 08:46		L			L	

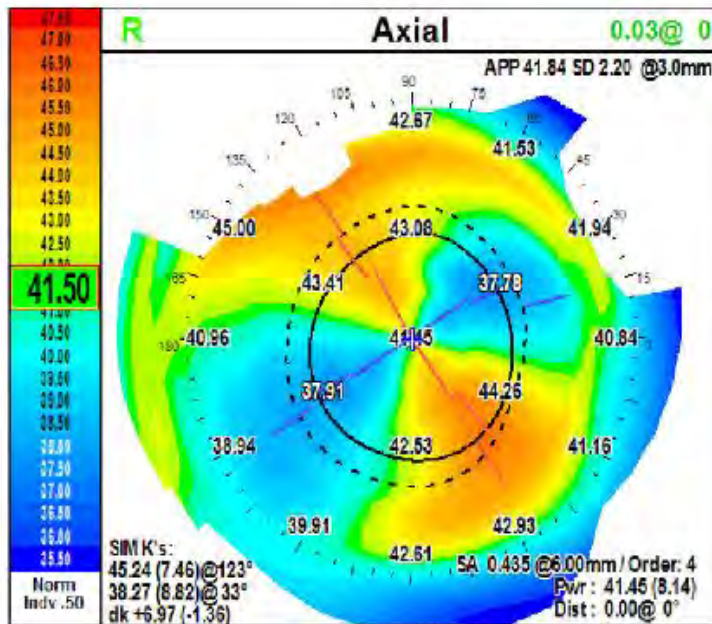


Case #4 OD

8/26/2022 High magnitude astigmatism 7.0 Diopters (regular)

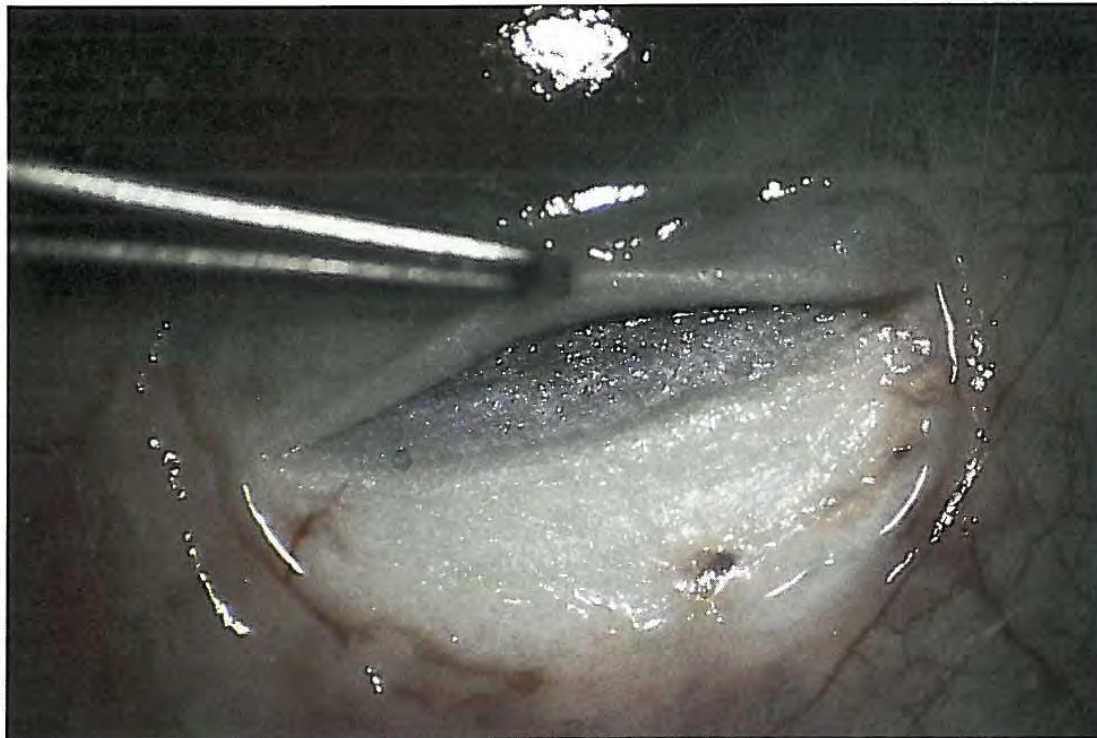
9/14/2021 DALK 9.0mm

L	08/26/2022 07:42	Comment	L	Diagnosis	L
R	08/26/2022 07:42		R		R



Scleral Recession: Astigmatic Keratotomy technique to reduce corneal astigmatism using a long scleral tunnel on steep axis to relax the cornea in that meridian

The Incision



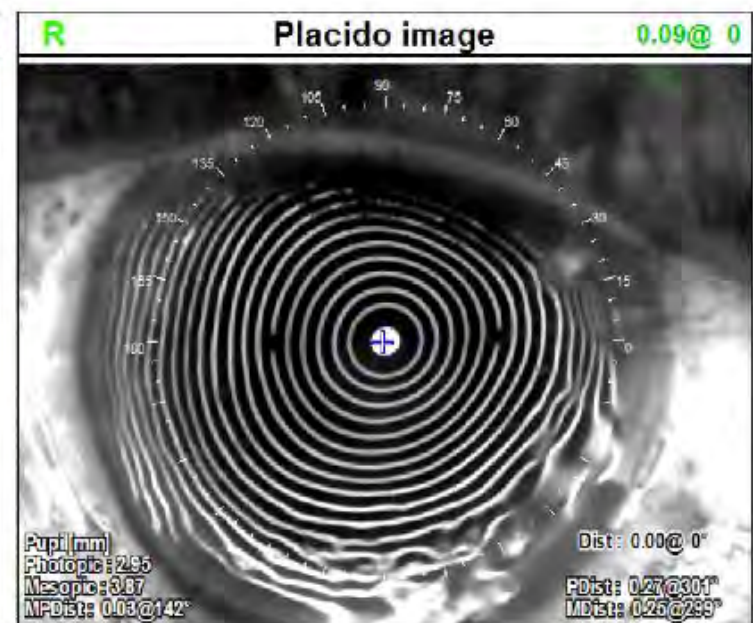
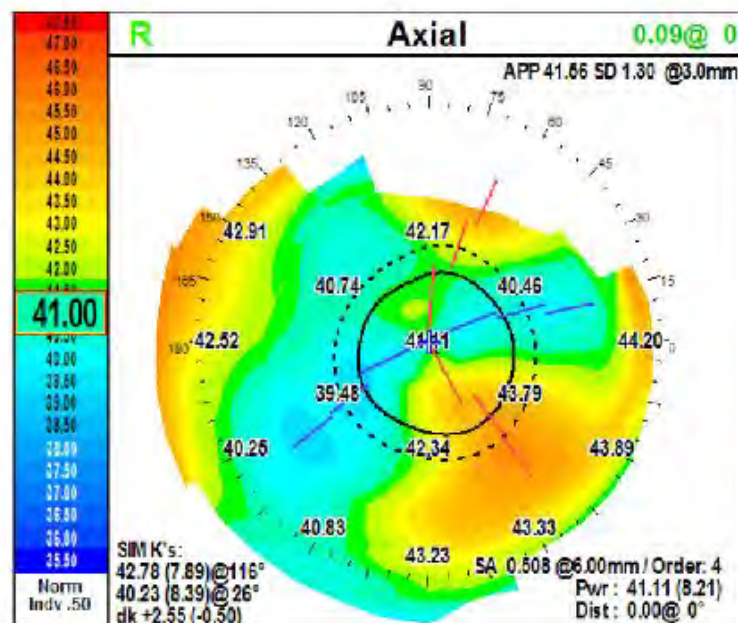
3-7. Shelf of the incision. The shelf portion of the incision holds the iris back and helps prevent iris prolapse.

Case #4

9/14/2022 topographic cylinder reduced to 2.5 D

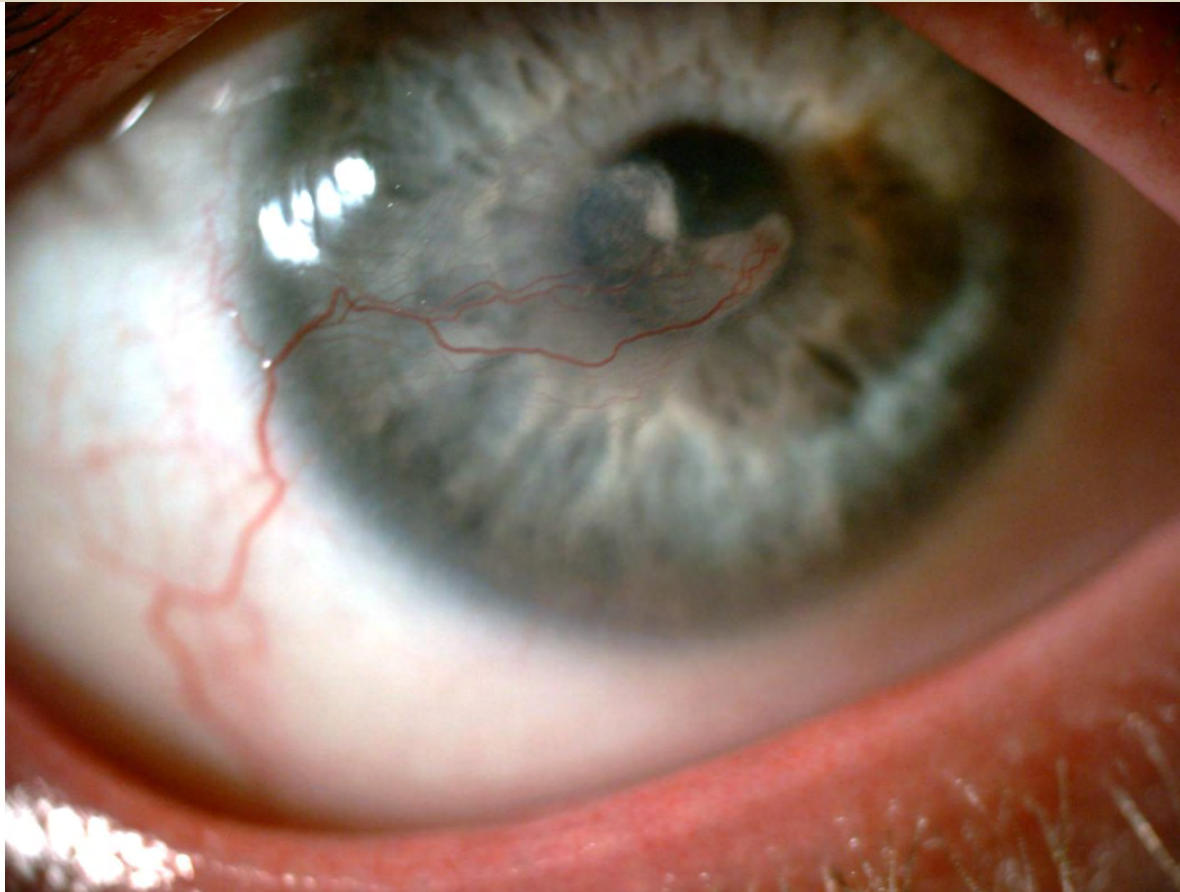
8/30/2022 Scleral Recession incision x 120 deg

Date	L	R	Comment	L	R	Diagnosis	L	R
	09/14/2022 09:12	09/14/2022 09:12						



Case #5 OD

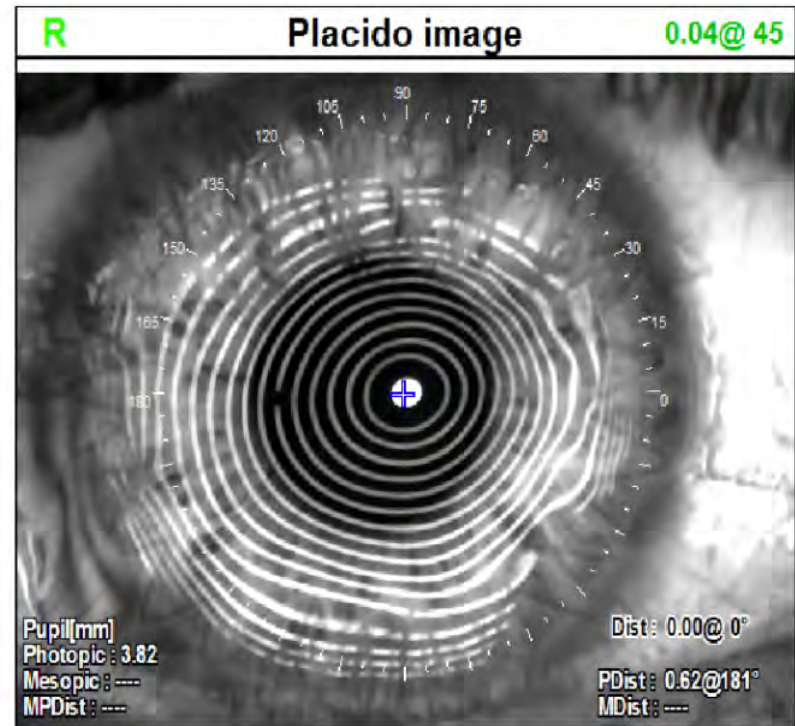
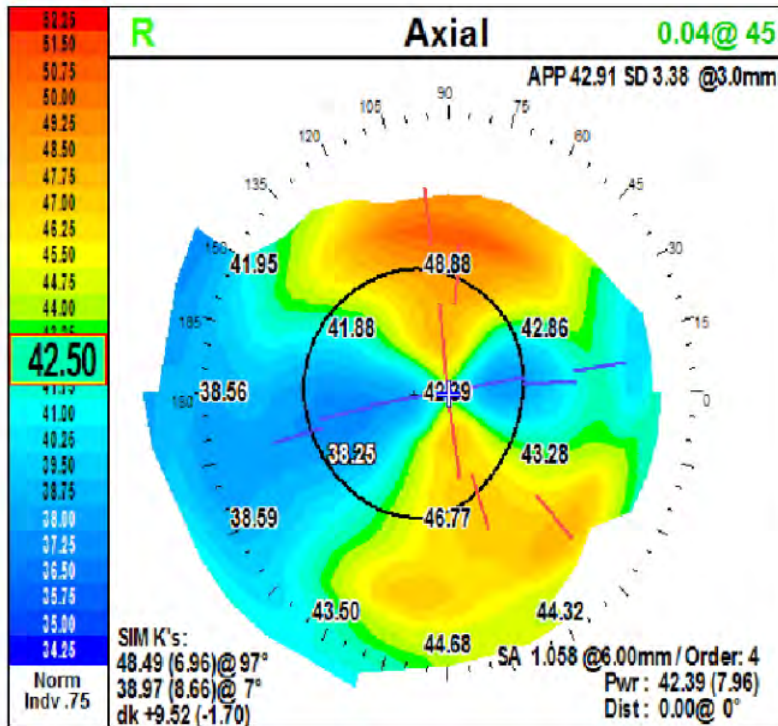
18yo Male w Cornea Scar (HSV)



Case #5: OD

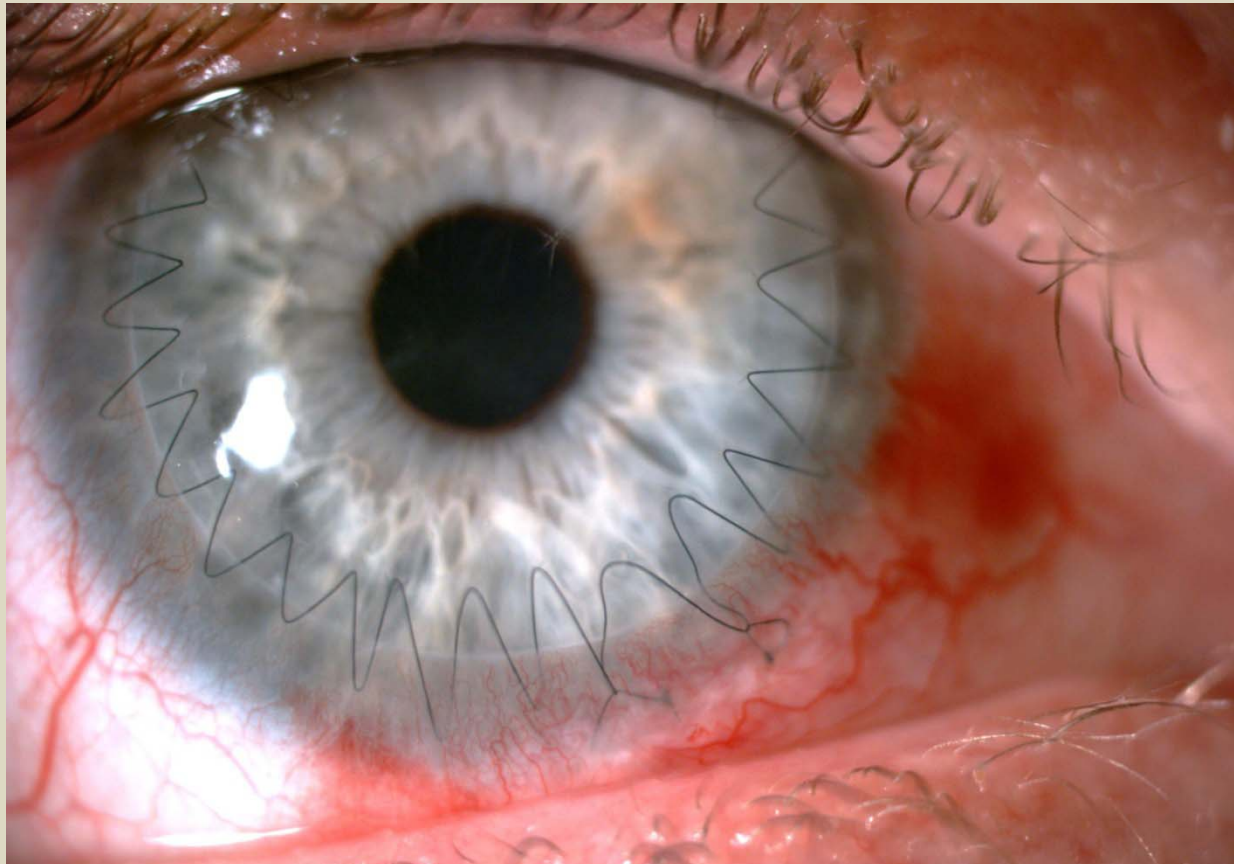
Cornea Scar (HSV) 5 wks aft DALK: 7/16/2019 high cylinder – loose running suture loops

R	08/23/2019 11:13	Comment	R	Diagnosis	R
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Case#5 OD

Loose running suture loops: fixed with interrupted plication sutures at 4 & 5 o'clock. Adjusted suture tension under guidance of intraoperative keratometer.

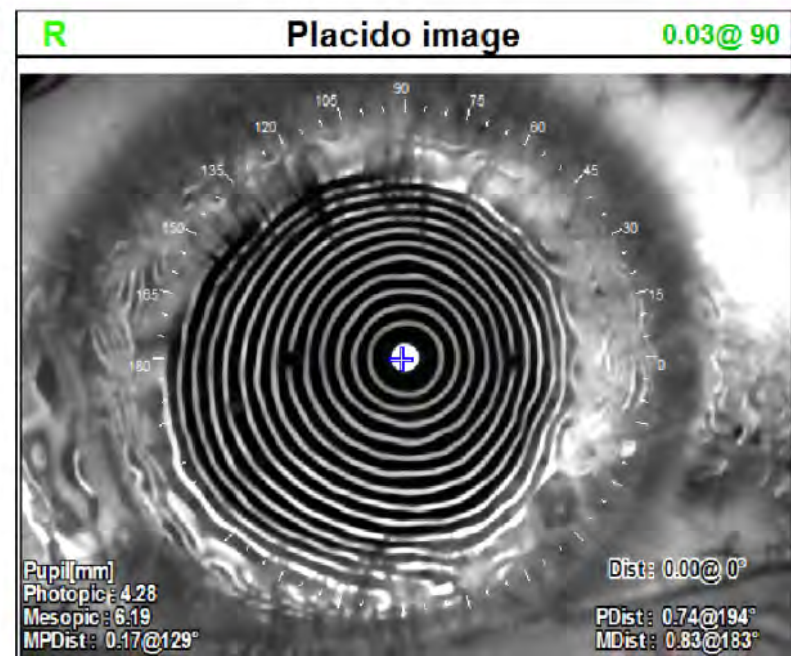
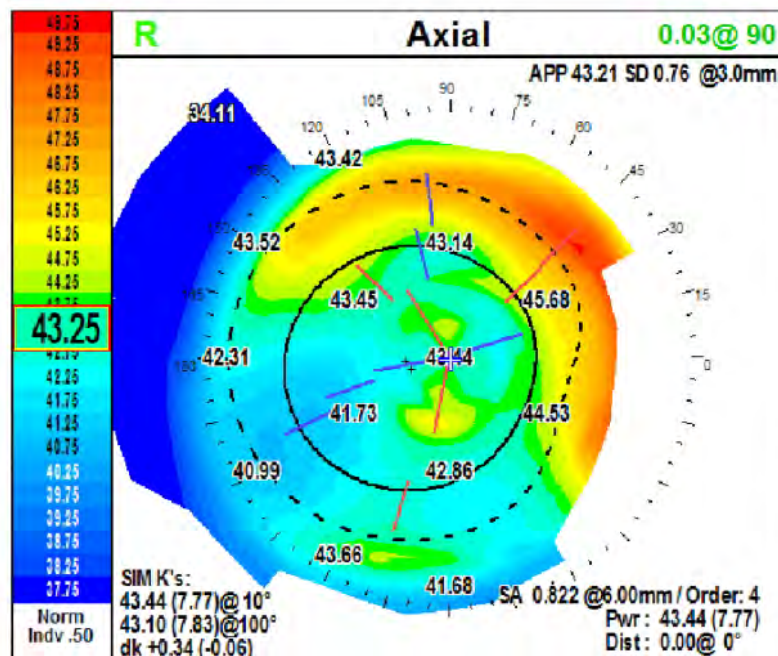


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Case #5: OD

2 wks after running suture adjustment:
UCVA 20/40 +0.5+0.75x78 20/30

R	09/09/2019 10:56	Comment	R	Diagnosis	R
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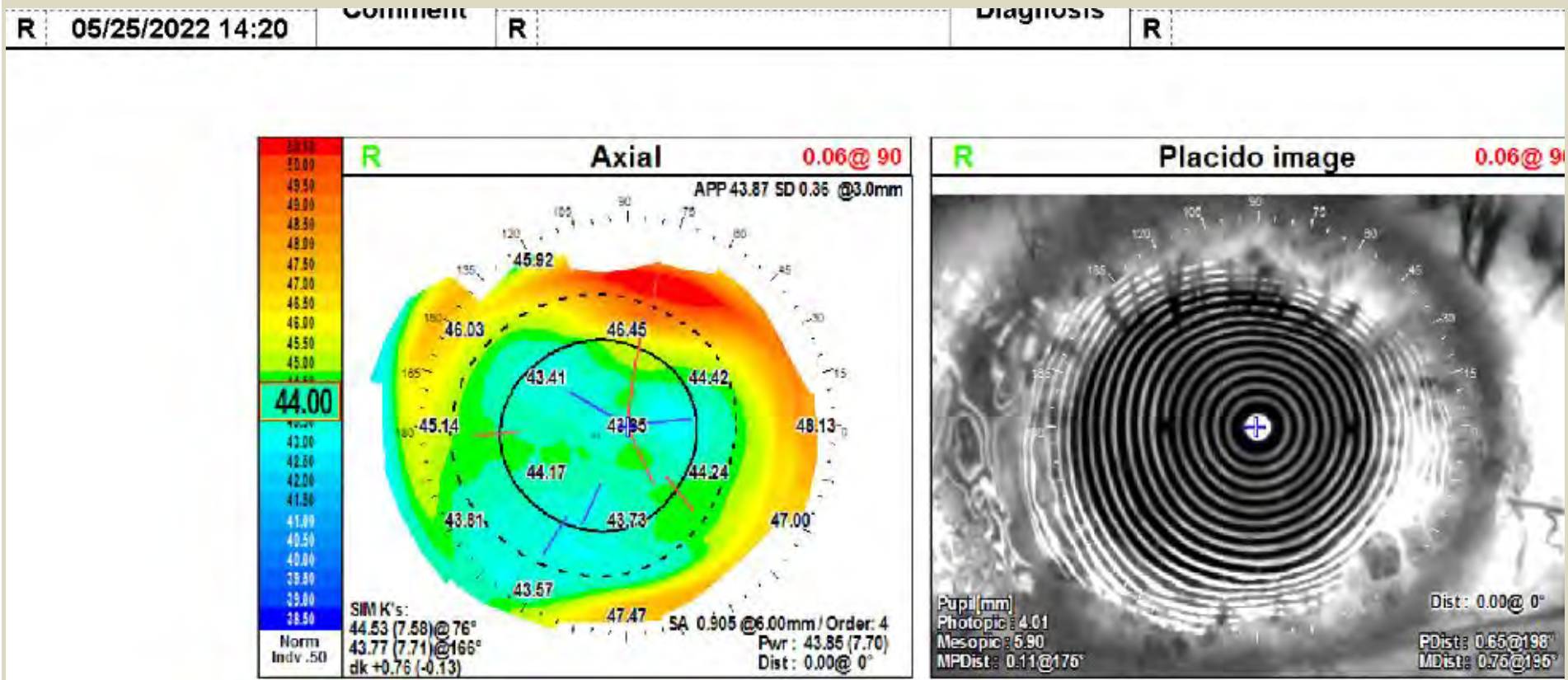


Case #5 OD

6/25/22 (Topo below) Plano +1 x 65 20/25

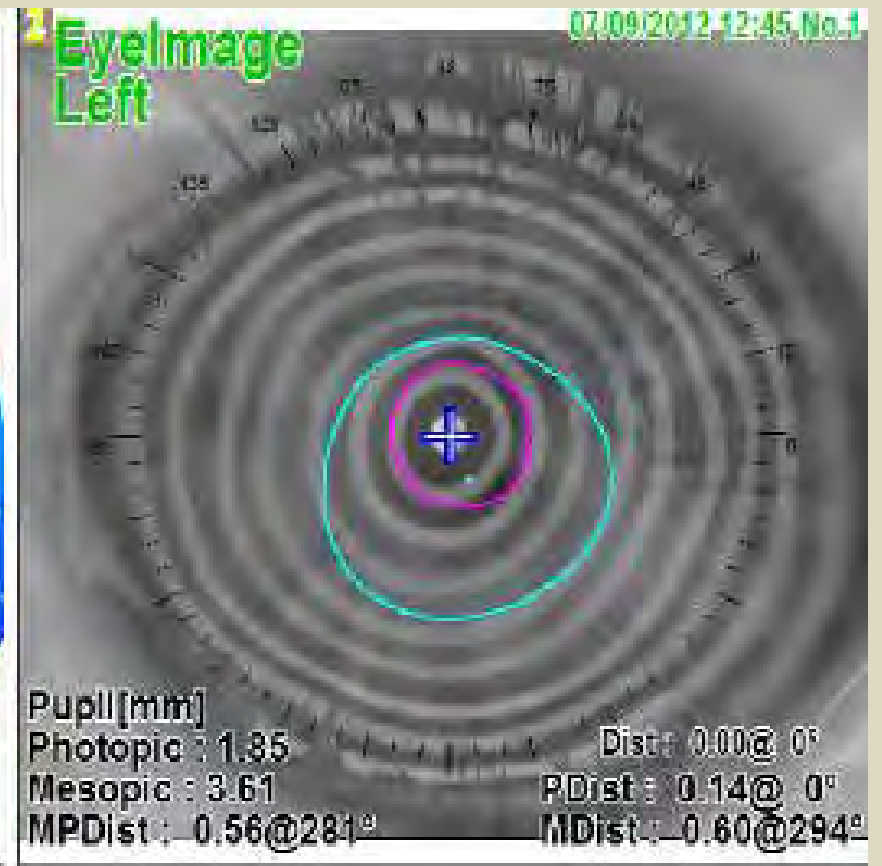
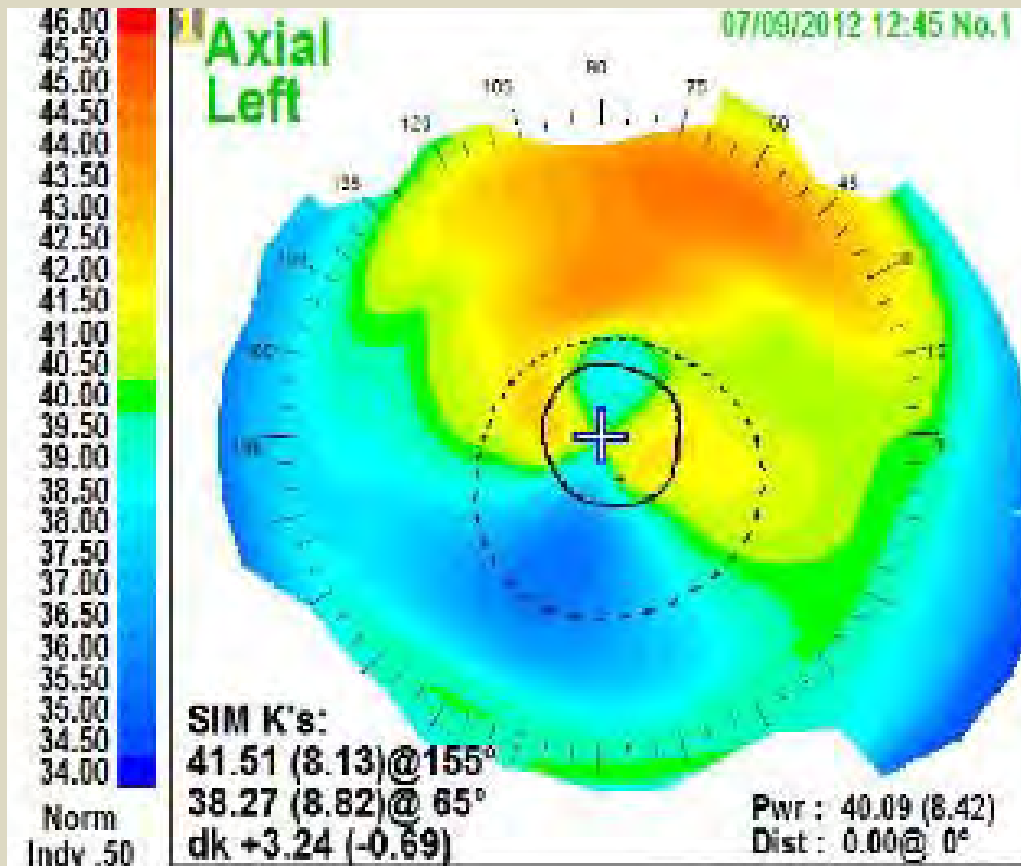
11/12/2020 Removed running corneal suture Uncorrected VA 20/40

7/16/2019 DALK



Case #6 OS (Left Eye)

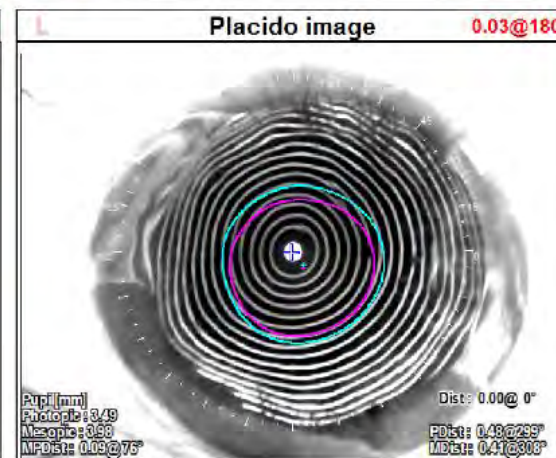
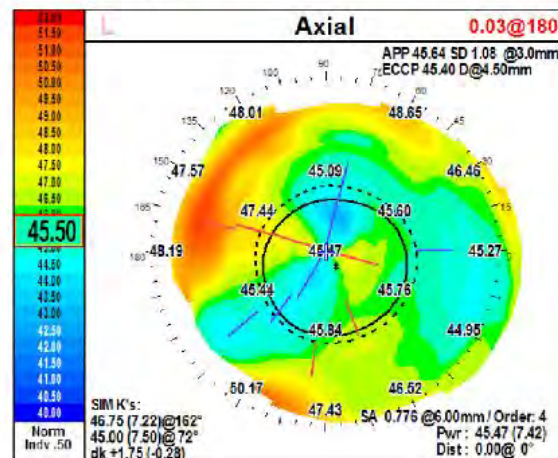
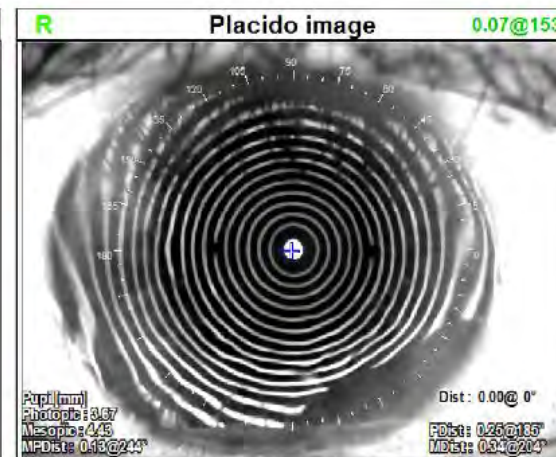
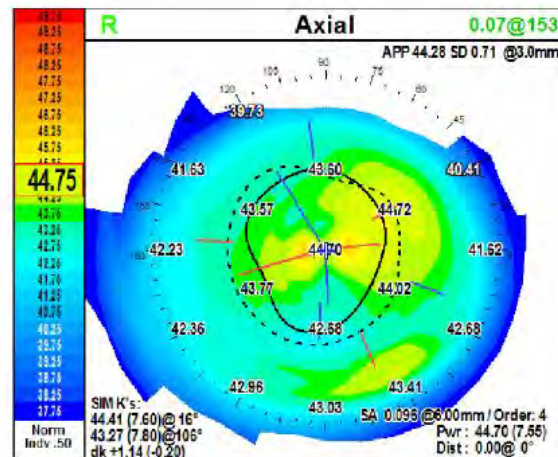
58 yo Cornea Scar since age 20



Case #6 OS

12/2021 Topo (below) still stable 9 years after
7/21/2012 DALK 9.0mm

L	12/13/2021 15:17	Comment	L	Diagnosis	L
R	12/13/2021 15:17		R		R



Case Reports: Large Diameter DALK for

Cornea Scars

Conclusion:

- Faster visual rehabilitation.
- Running cornea suture technique is ADJUSTABLE if necessary to reduce early astigmatism and rx glasses or soft contact lens early optical rehabilitation
- less corneal aberrations than PK
- Long term graft endothelial rejection/exhaustion – graft failure eliminated
- If donor/bed centered, residual astigmatism is almost always regular
- Cornea Topography VERY stable over time – NO long term ectasia more often seen with PK and rarely reported with smaller dia DALK
- Closed procedure – does not disturb trabecular meshwork -
No increase in Glaucoma