

# Irregular corneas

## The Bad, the Ugly and the Impossible

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# Fitting options and approach

- Every irregular cornea is individual and different from any cornea before
- Use all your fantasy and skills, going behind traditional thinking and fitting
- Large diameter for better centration and more stable vision



# Fitting options and approach

- Over-passing irregular areas and fitting on more regular and stable cornea areas are often the way to go for long-term success
- High DK material and an adequate lens care system are essential for physiological acceptance



# Fitting options and approach

- Use the hole spectrum of CL designs:
  - Spheric, aspheric, toric, peripher-toric, reverse geometry
- High DK (100) materials:
  - Boston XO / HDS 100 / Contamac Extra
- Hyper DK ( $>100$ ) materials:
  - Menicon Z / Contamac Extreme



# Keratoconus



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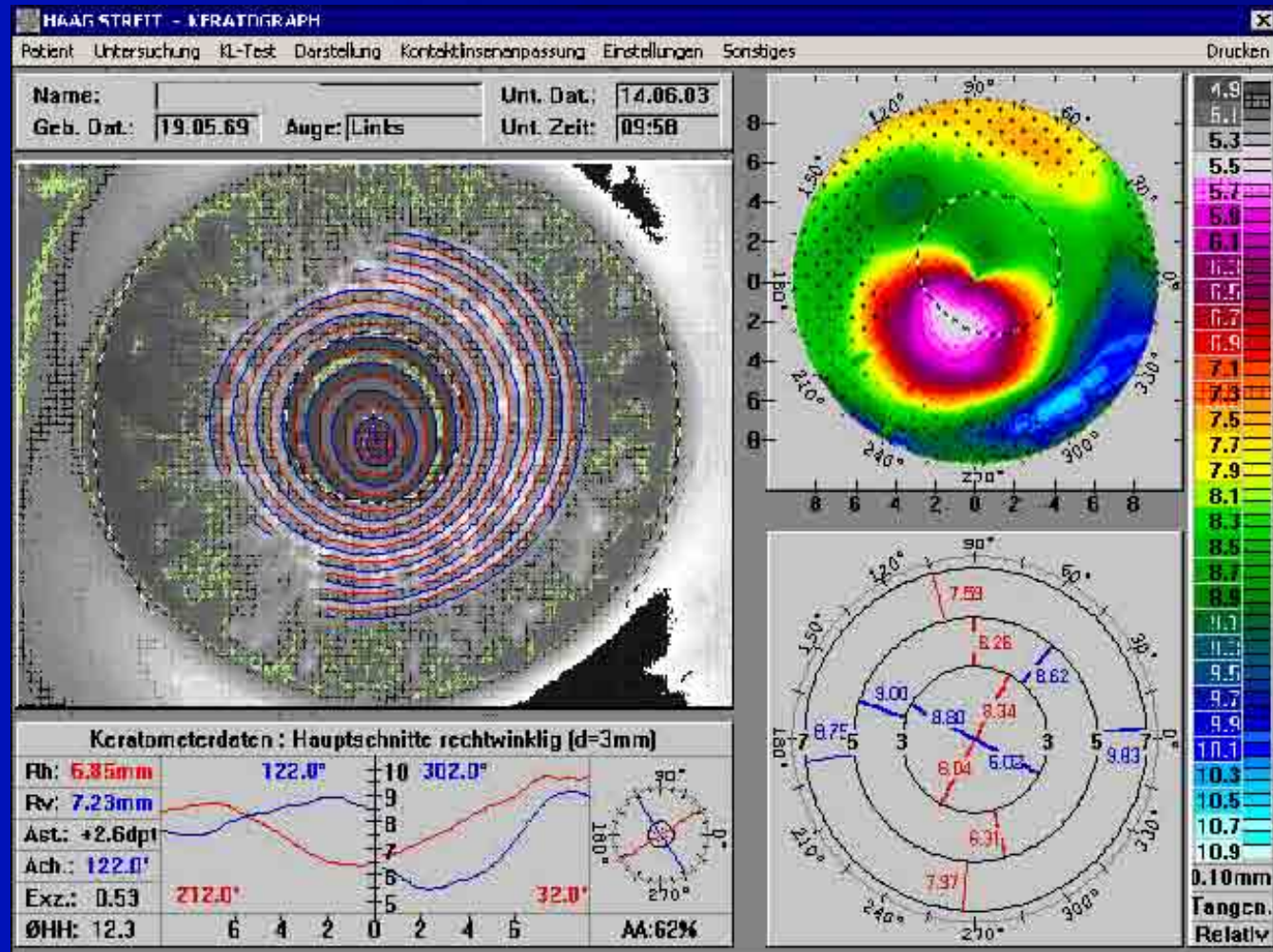
# Detecting Keratoconus

- Patient history
- Refraction
- Retinoscopy
- Ocular inspection with Biomicroscope of the anterior segment
- Mires (Keratometer)
- Videokeratography
- Pachymetry





# Videokeratography



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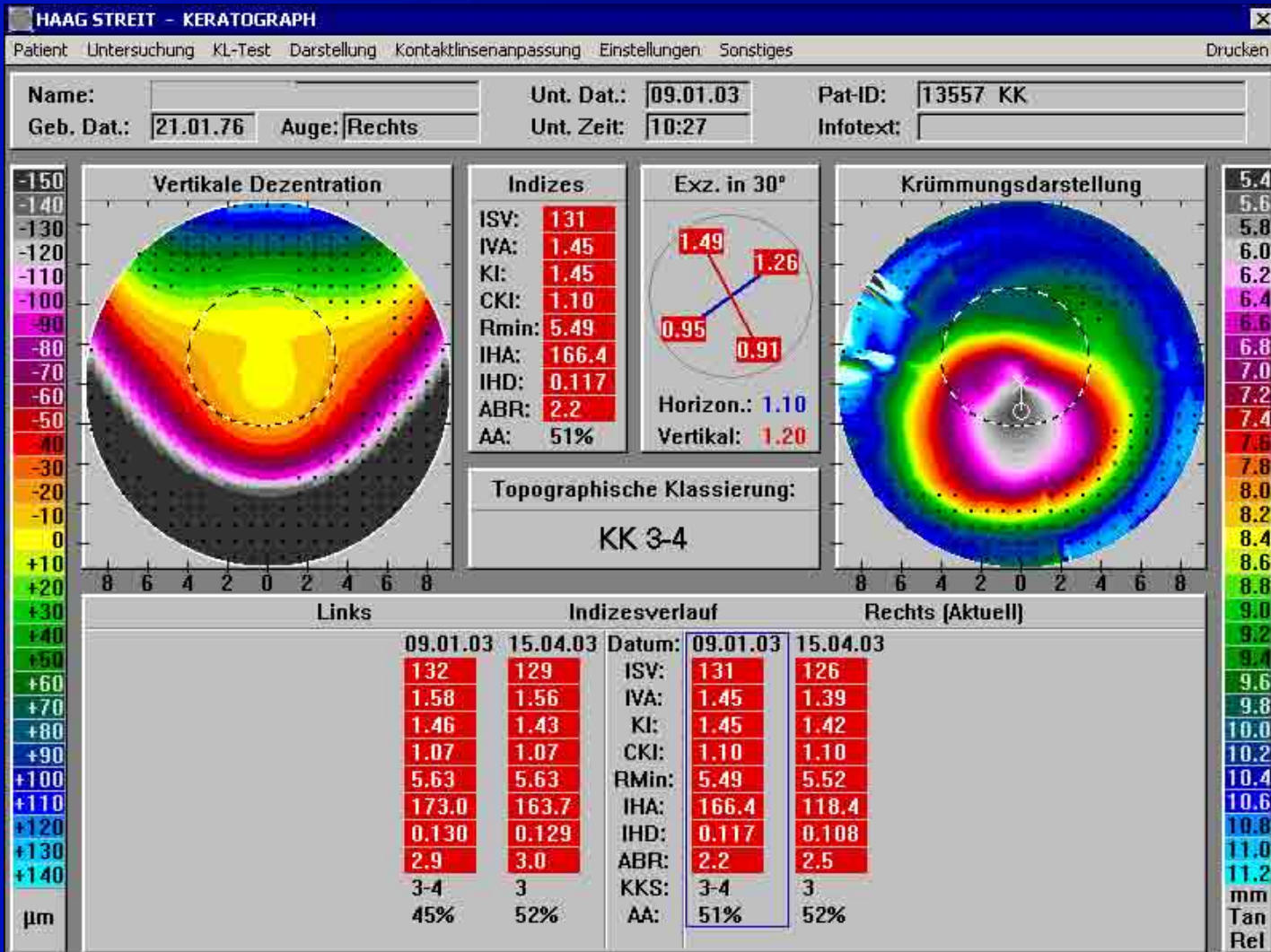
# Indices Oculus CTK 922

- Dr. Bürki, Thun, Switzerland
- New state of the art in communication with ophthalmologists
- Every involved person speaks the same medicine “language” and it is possible to quantify with the same dates and interpretation!





# Indices Oculus CTK 922



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# Indices Oculus CTK 922

Please note:

- This assessment by the Keratographer software is entirely based on topography and is not to be regarded as a basis for a clinical diagnosis!!



# Contact lens fitting procedures



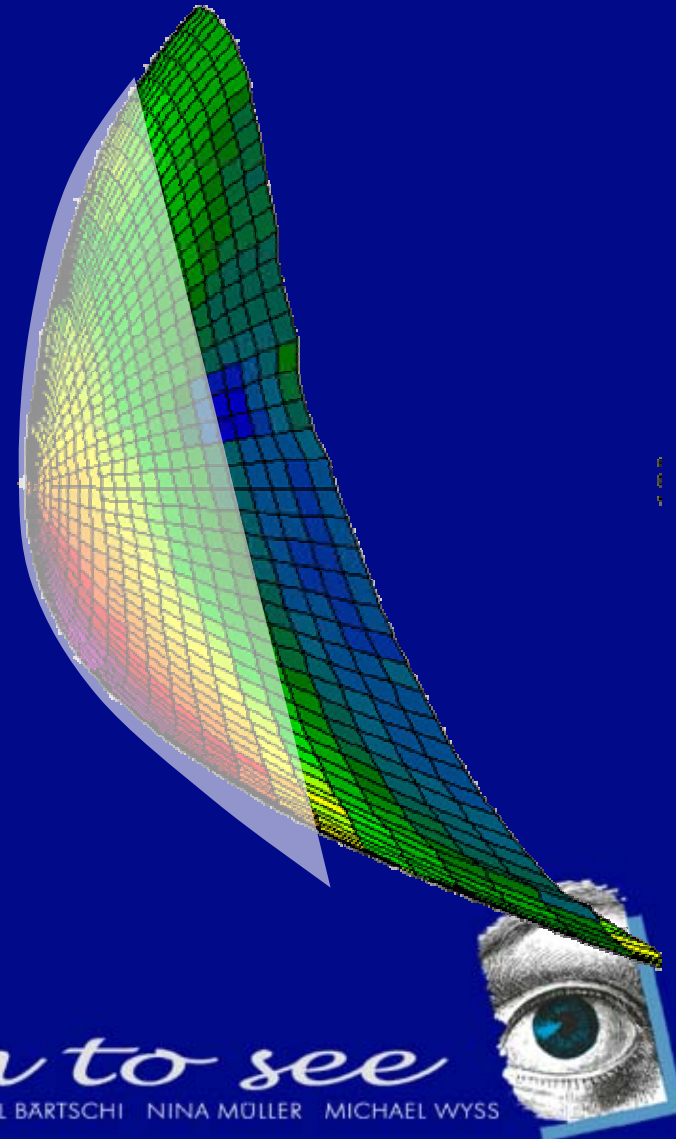
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# Rotation symmetric Design

- Rotation symmetric design
- Pay attention to the edge lift in 270°

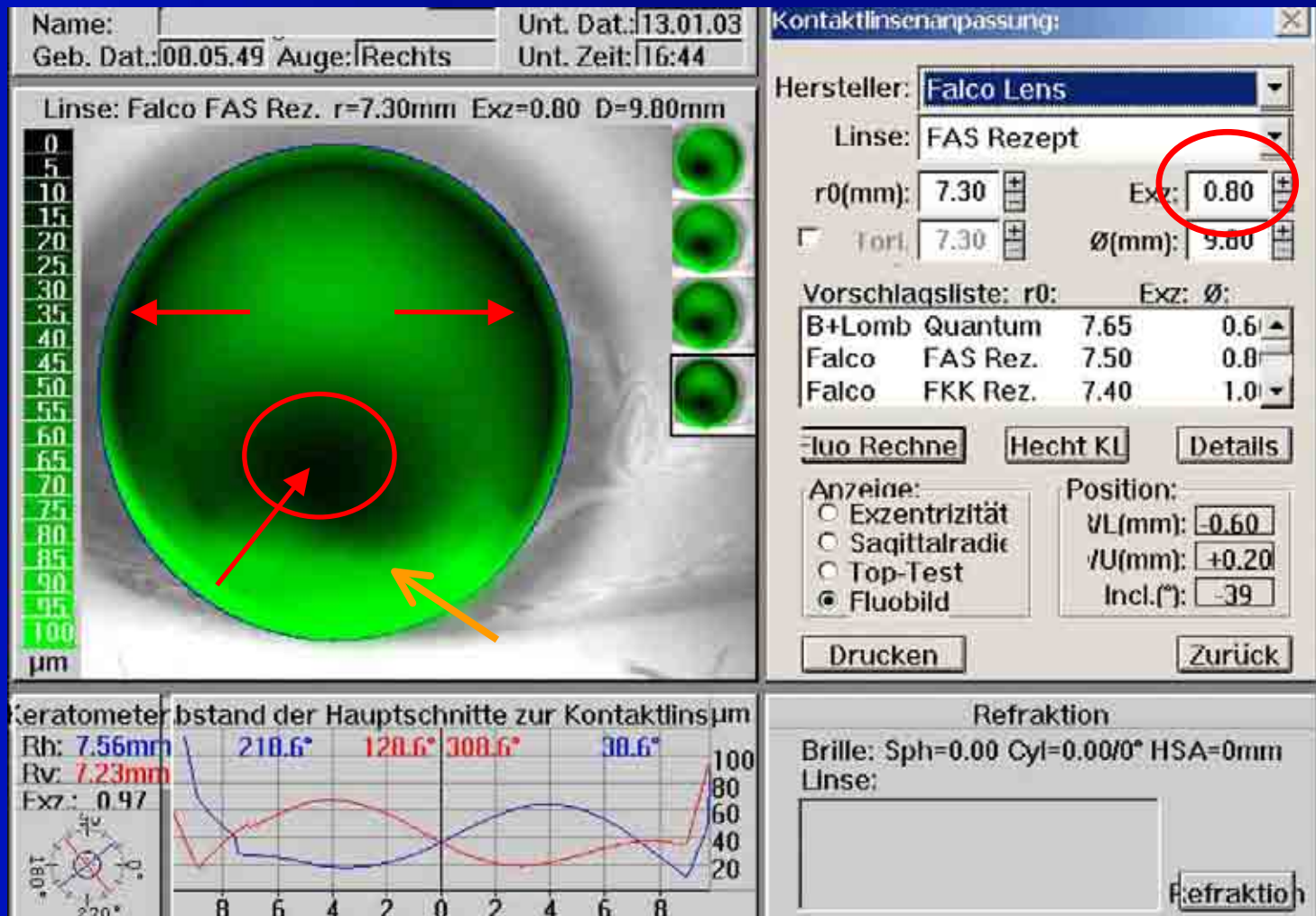


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# Rotation symmetric Design

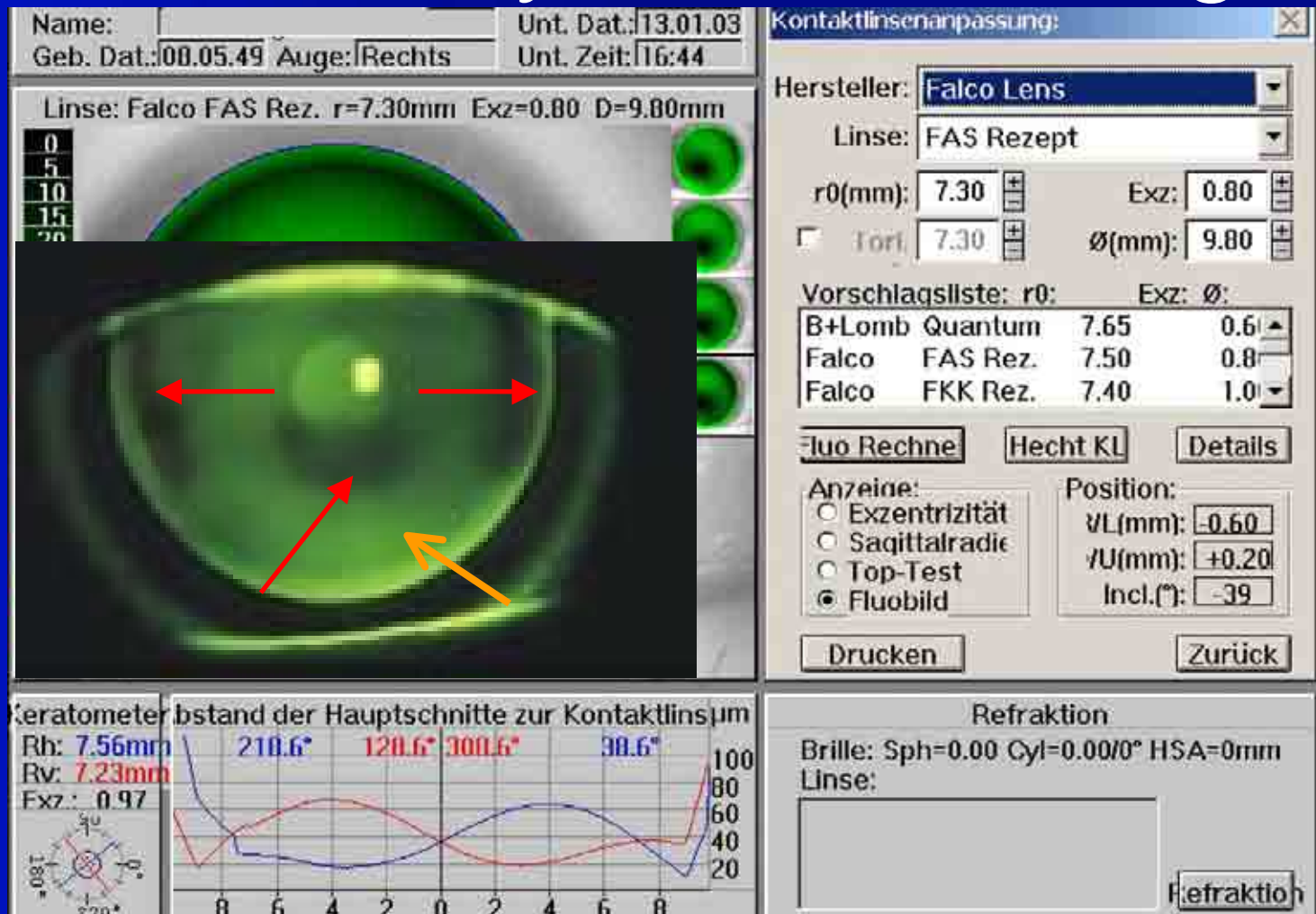


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# Rotation symmetric Design



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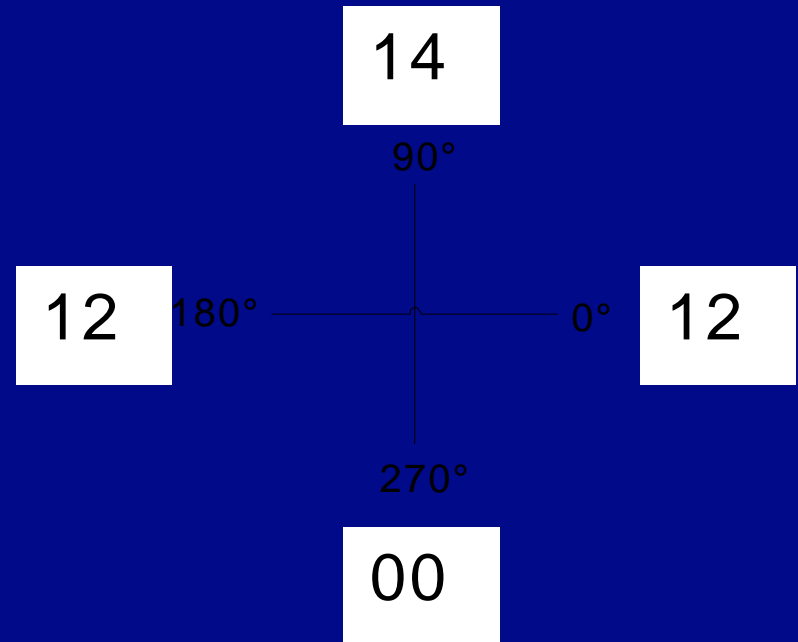
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# FKQ Design

- Falco, Switzerland
- **F**alco **K**eratoconus  
**Q**uadrant-specificity
- 12 12 14 00 are the excentricitys in each quadrant

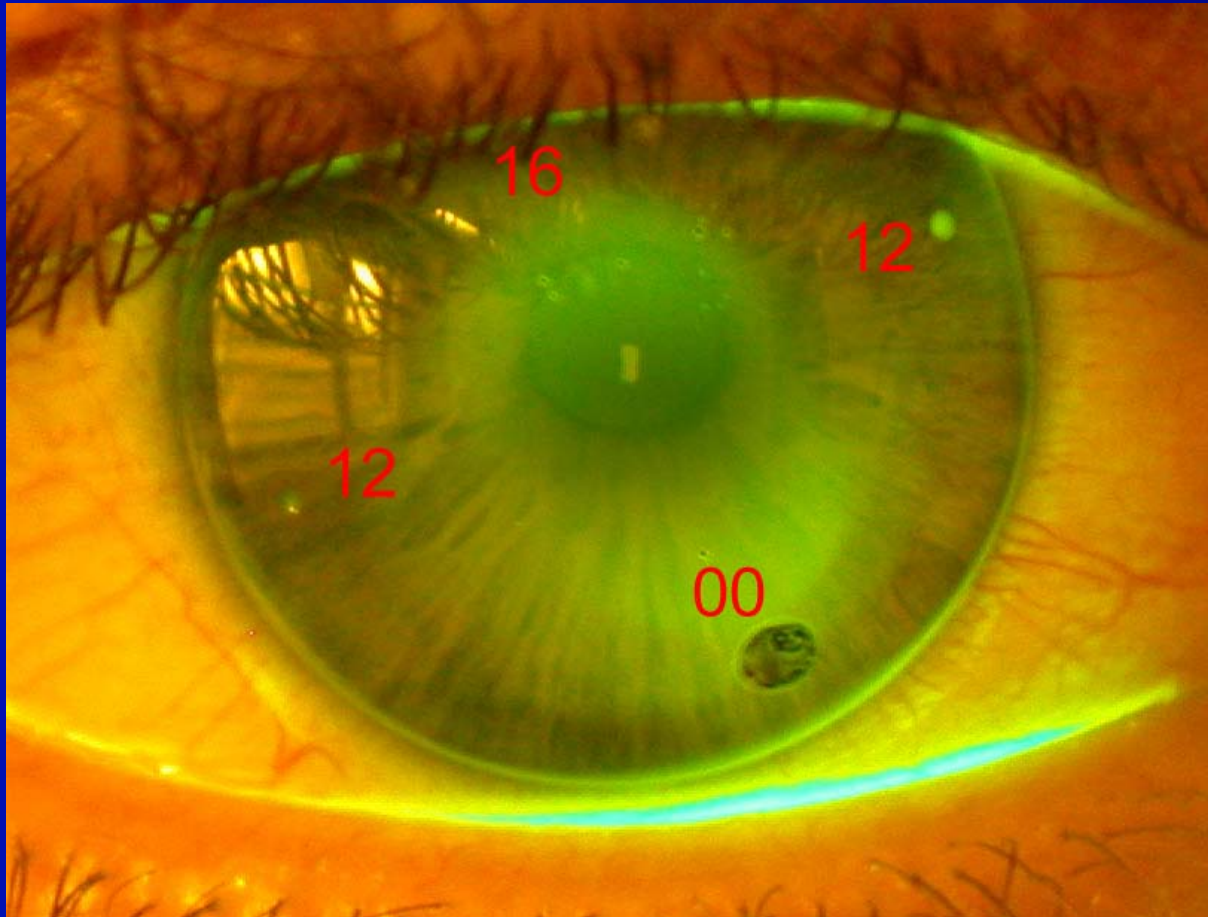


# Quadrant-specificity Design

- The idea is to fit the lens in every quadrant as good as possible to the origin cornea curvature
- The lens has inferior a black colored engraved point which must be inserted in 270°. The lens then will be click-in the cornea curvature



# Quadrant-specificity Design



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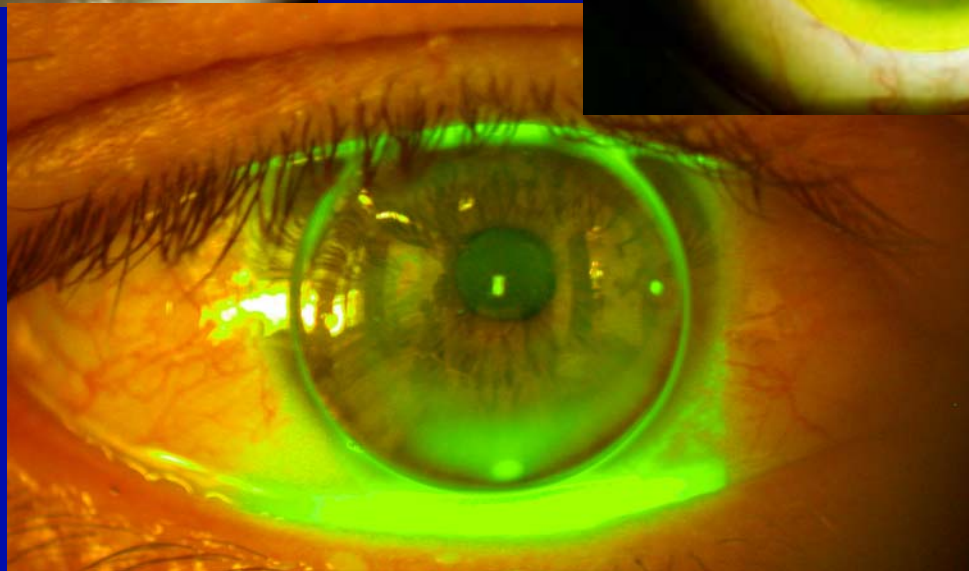
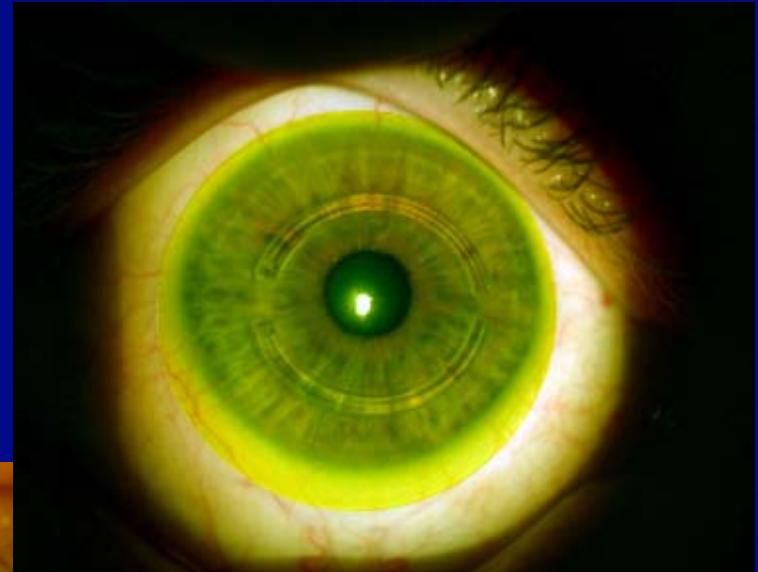


# Quadrant-specificity Design

- All parameters can be manipulated individually
- Design includes a hollow in the back curve center to relieve the apex
- Makes the fluorescein pattern looks like slightly steep fitted



# Diameter



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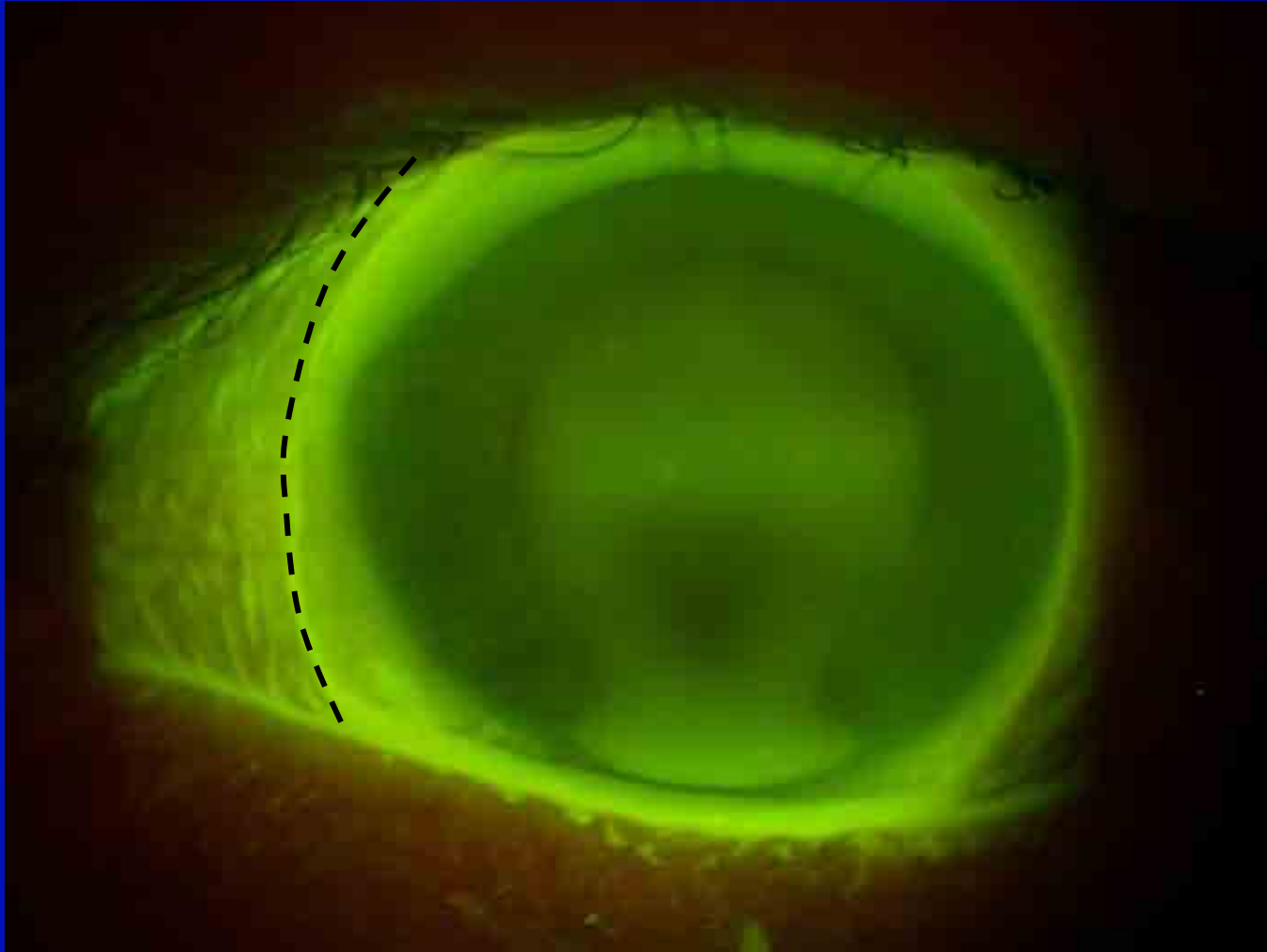
# Diameter Scleral Design

- No Topographer data's available
- Fitted by interpreting fluorescein pattern
- Avoid air bubbles beneath the lens in filling the lens with solution while inserting
- Adhering, but **no** sticking allowed





# Diameter Scleral Design



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# Piggyback

- Last opportunity, when everything else failed before
- Massive 3+9 o'clock staining
- Very sensitive Patient, or extremely exposed to dust

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# Piggyback

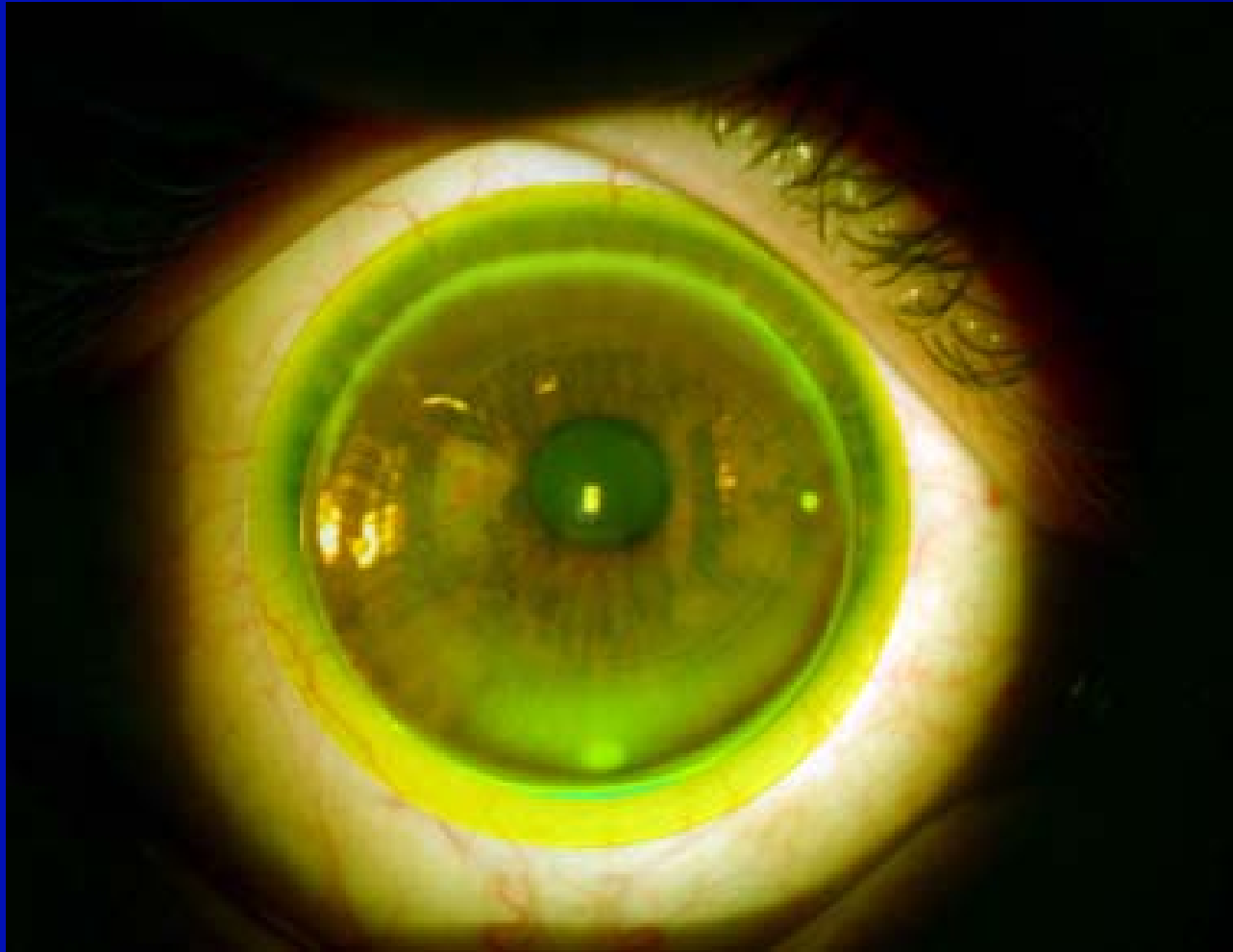
- Fit the GP like there's no soft contact lens beneath
- Don't tolerate any Neovascularization
- Siliconhydrogel (Night+Day, Purevision)
- High Minus Dpt can support centration

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# Piggyback



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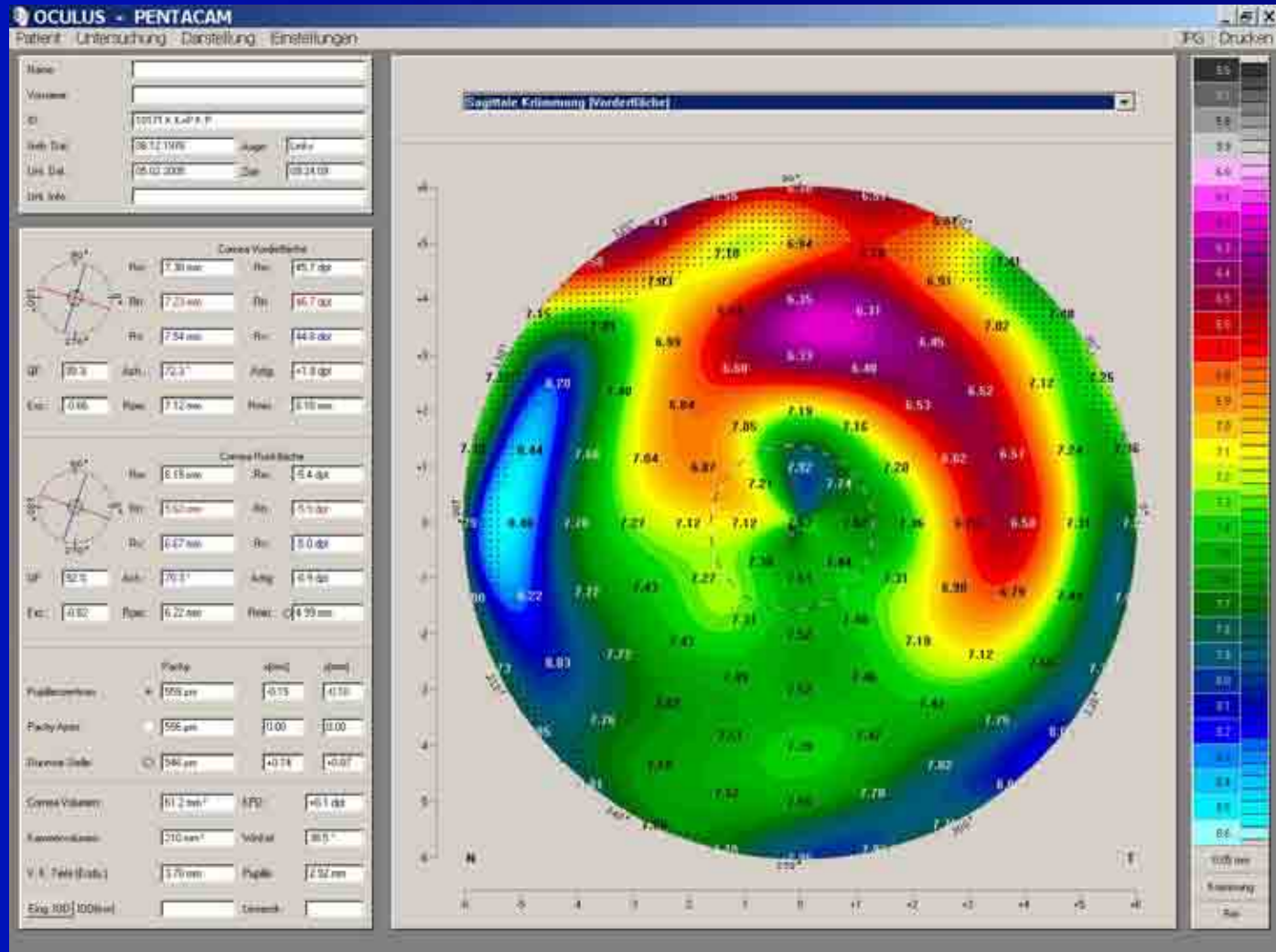


# Case BA

- Patient BA, 29 year old Caucasian male
- Keratoconus Patient, underwent Penetrating Keratoplasty
- Refraction:  
OS: -1.50D cyl -12.50D x 78°    Vacc 0.6p



# Penetrating Keratoplasty



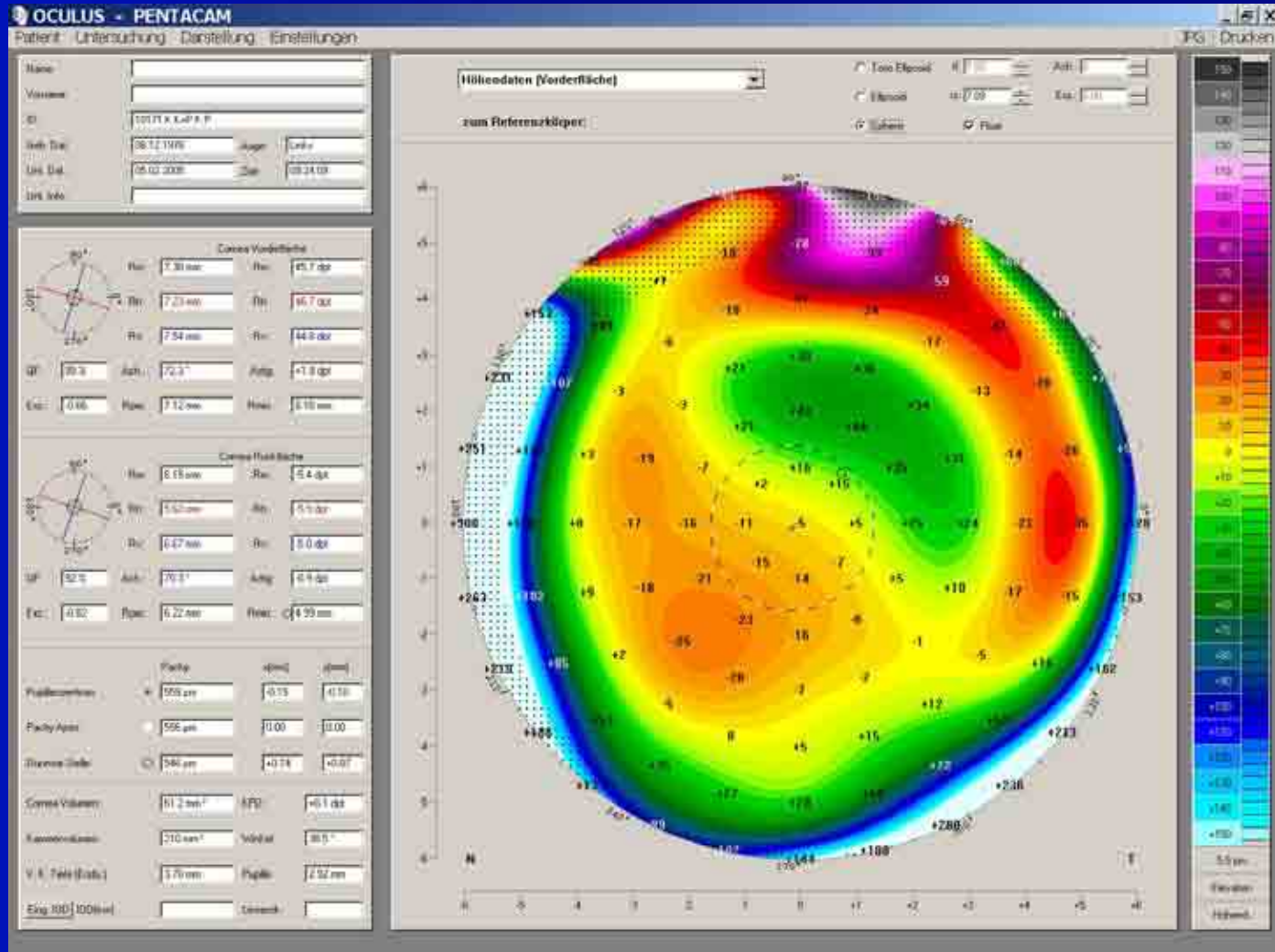
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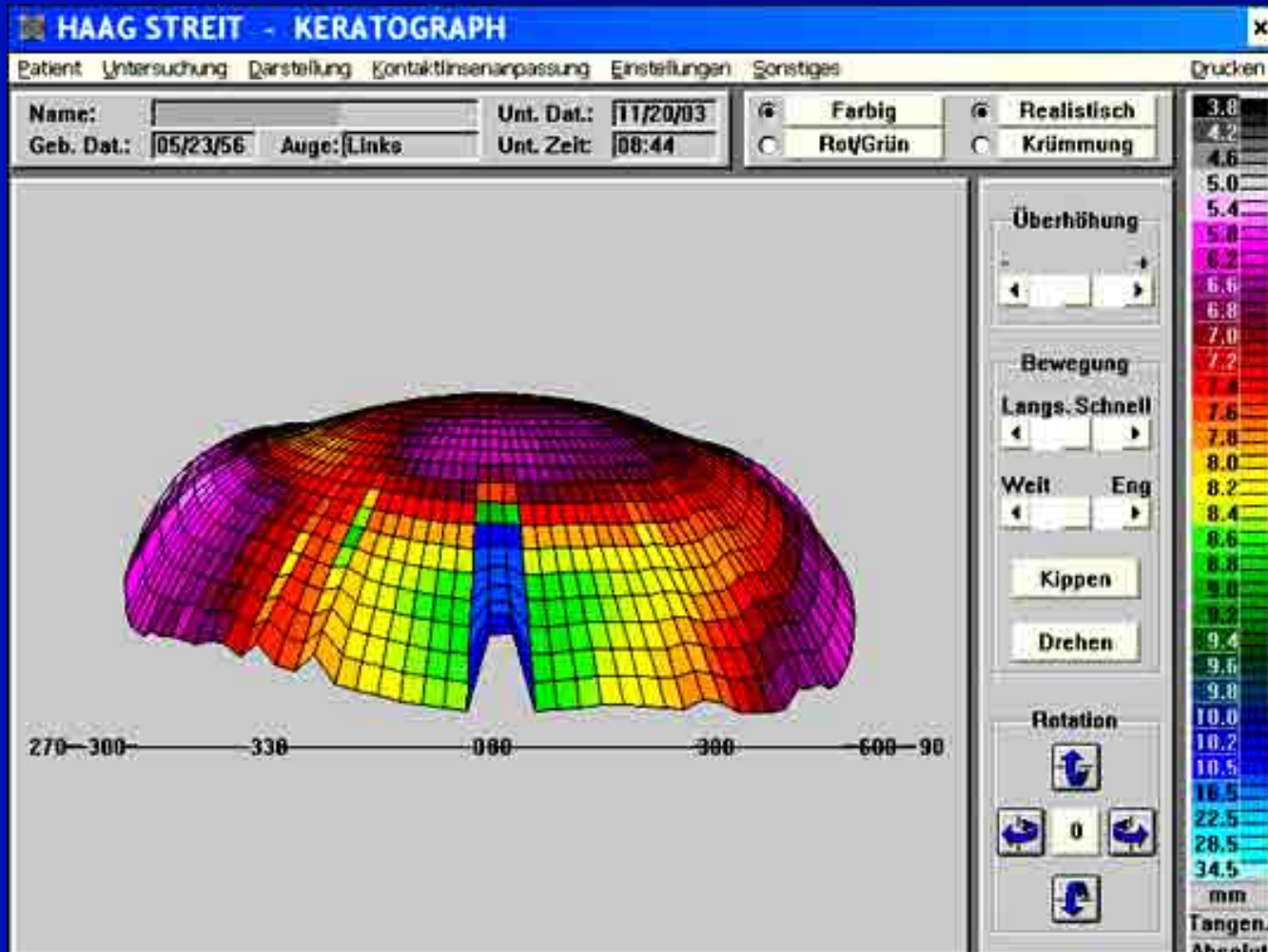
# Penetrating Keratoplasty



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# Penetrating Keratoplasty

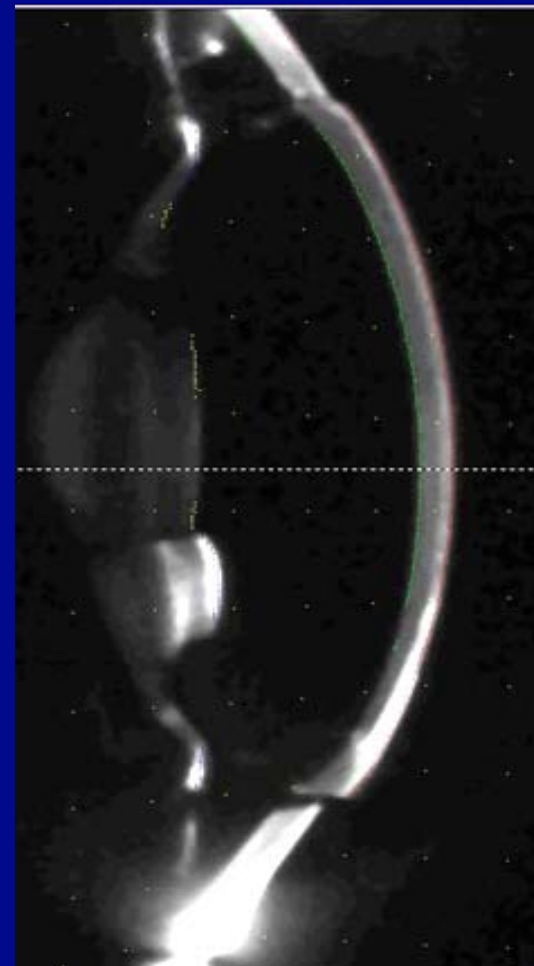
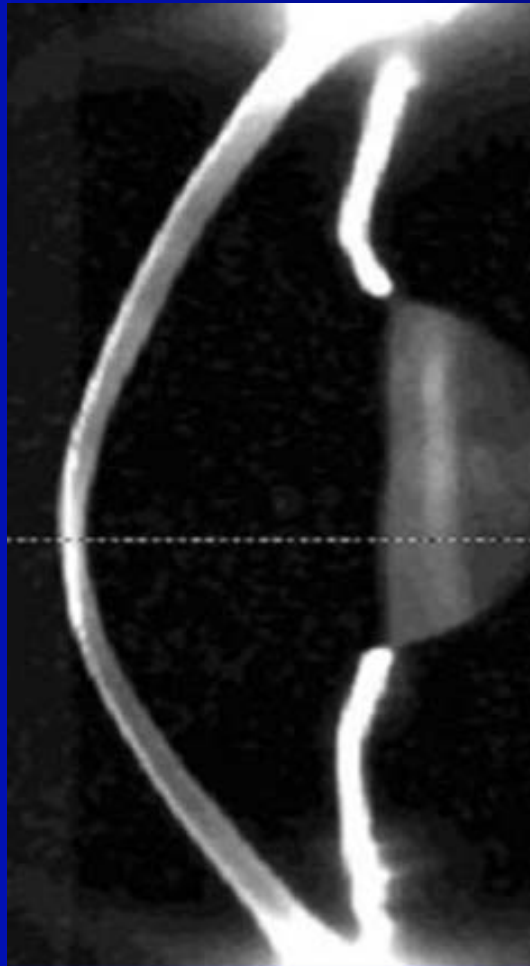


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# Penetrating Keratoplasty



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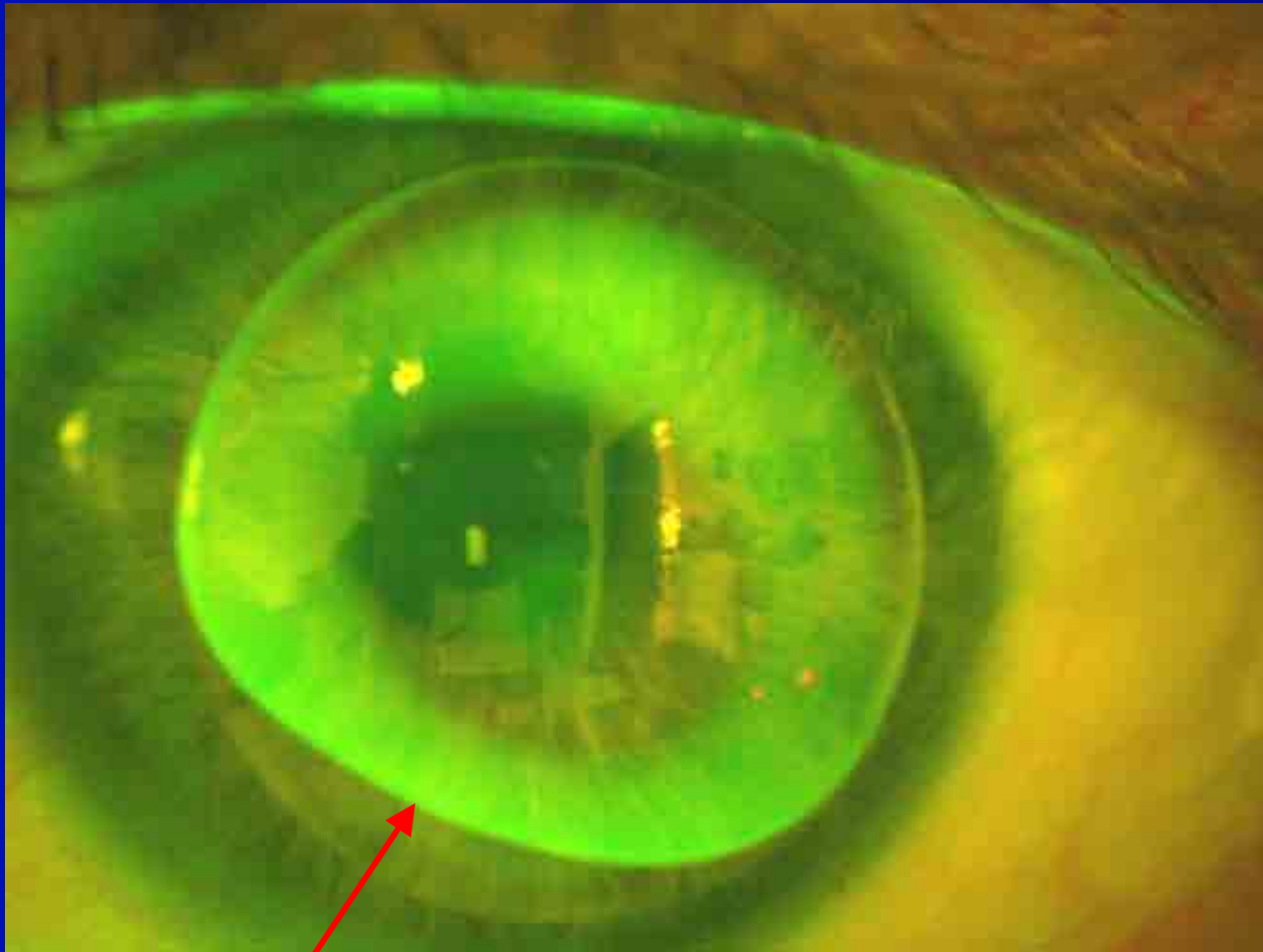
# Penetrating Keratoplasty

- The biggest problem is to fit the scar circle properly
- First try:
  - fitting a rotation symmetric small lens
  - 1-curve without eccentricity





# Penetrating Keratoplasty



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# Penetrating Keratoplasty

- Second try:
  - Bigger Diameter, with reverse geometry
  - Spherical optic, Periphery-toric alignment
- Periphery-toric Design
  - Horizontal Eccentricity 1.0
  - Vertical Eccentricity 0.6
- Astigmatism of 2.4 dpt in the Periphery

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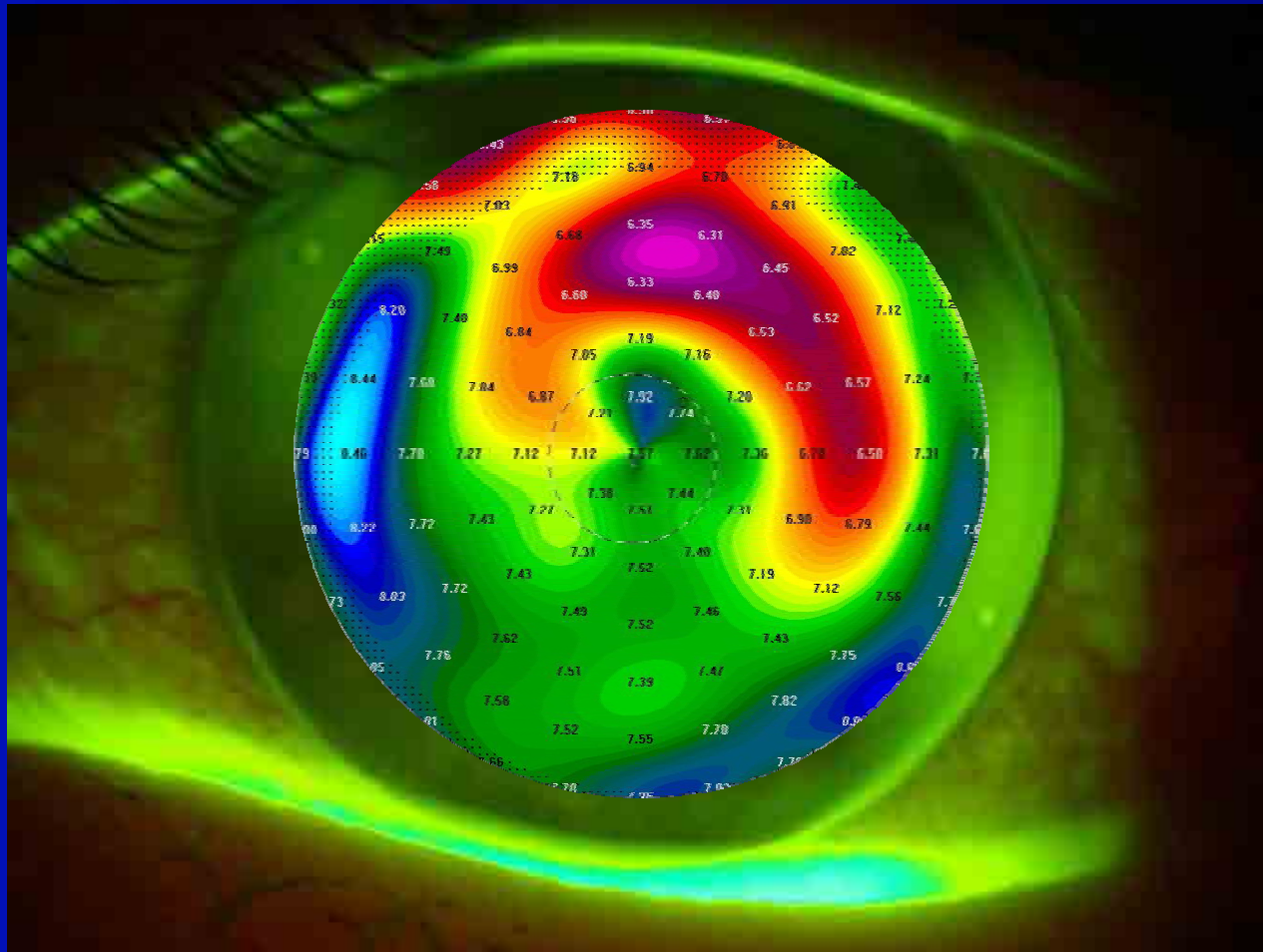


# Penetrating Keratoplasty

- Reverse geometry
  - Quit similar design to Orthokeratology
  - Bigger optical zone diameter
  - In this special case the reverse zone was 8 micron steeper than a Ortho-K lens would be on this eye
- Falco, Switzerland FKPX 10/06
  - 7.60 -4.0 dpt 12.00 Diameter v8



# Penetrating Keratoplasty

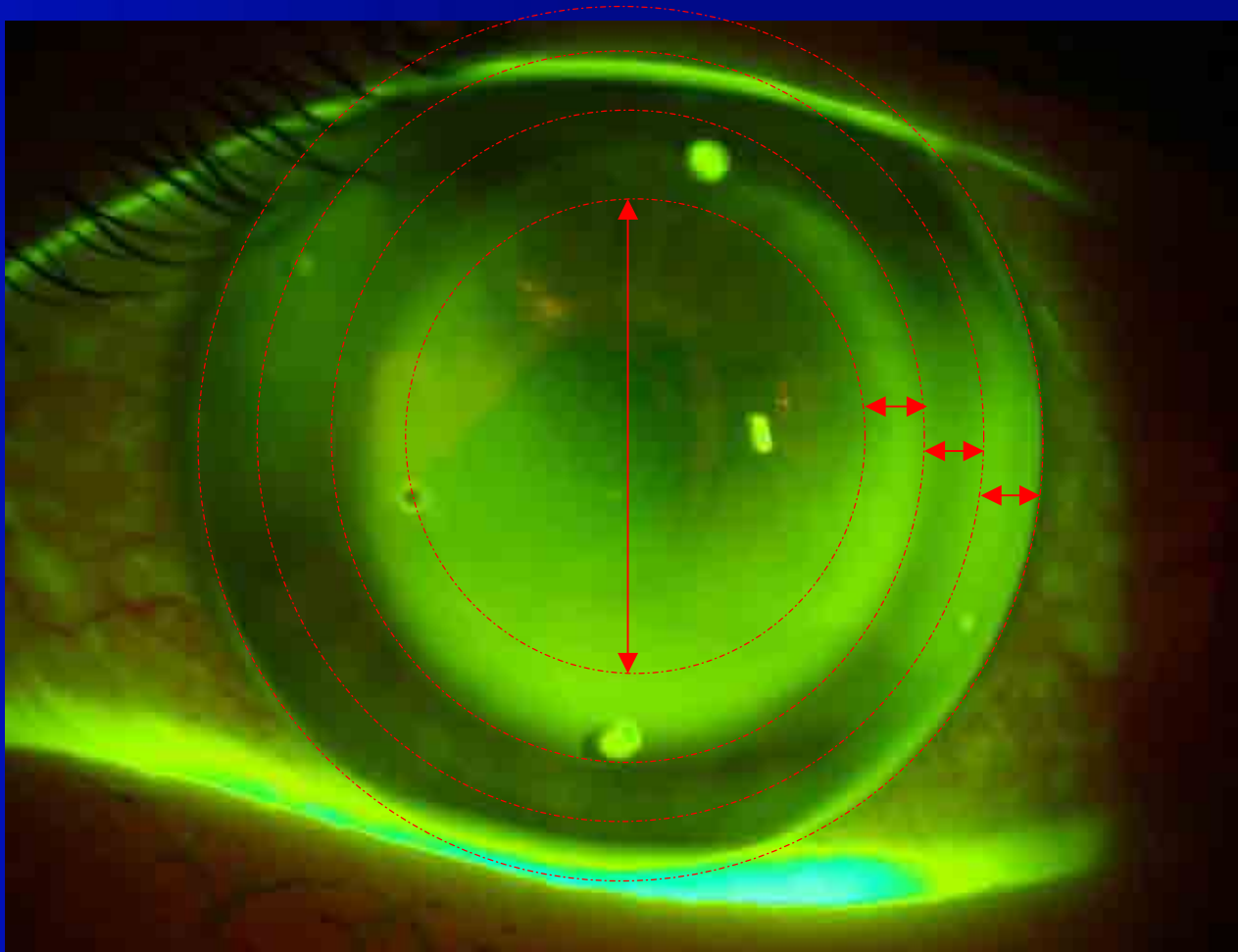


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# Penetrating Keratoplasty



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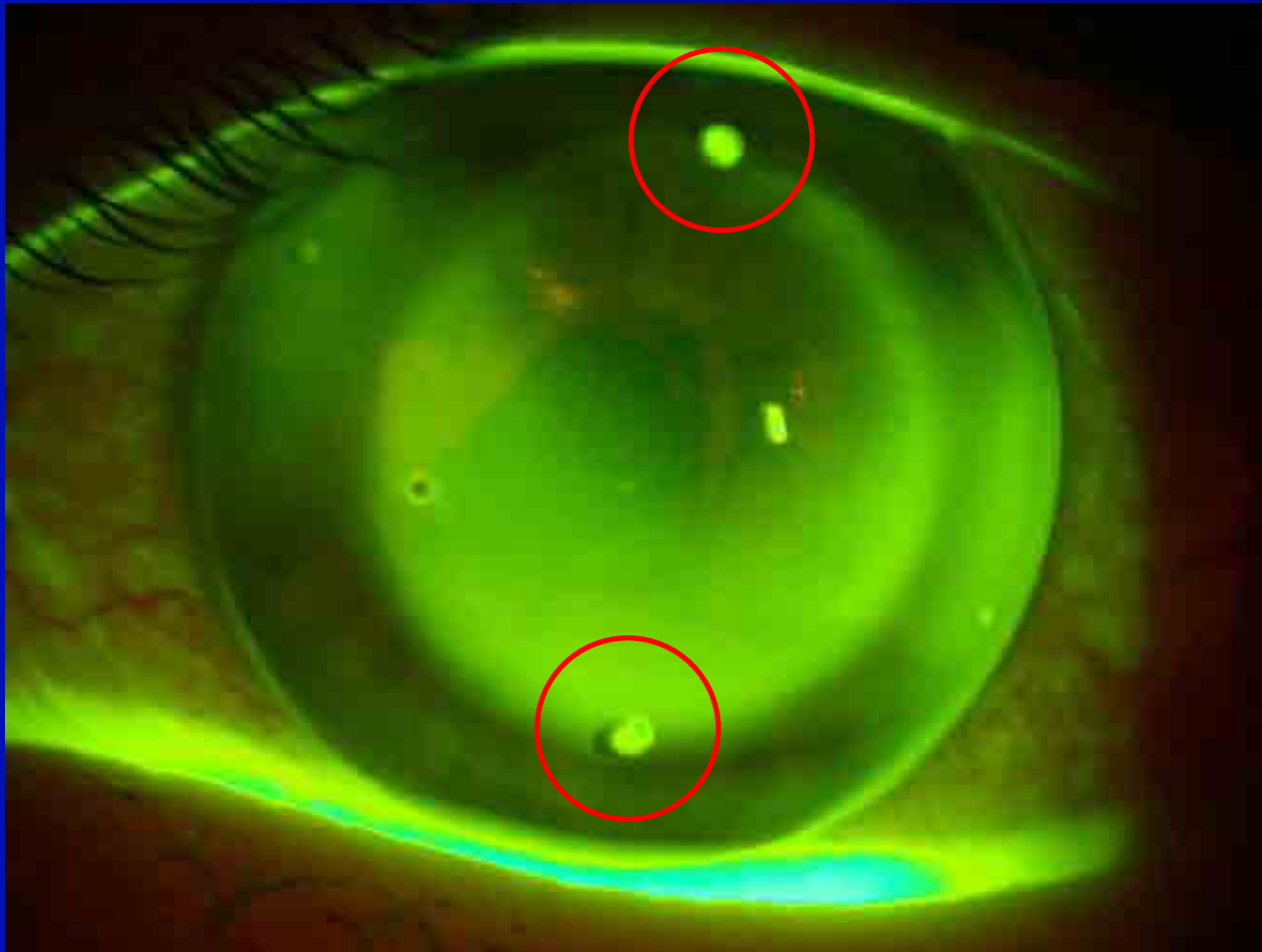


# Penetrating Keratoplasty

- In cases with deep reverse zones, it is important to fill the lens with solution before inserting
- Additional ventilation drill holes can be very helpful
- The holes are just made to let air bubbles go out of the reverse zone



# Penetrating Keratoplasty



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# Penetrating Keratoplasty

- Wearing time up to 15 hours
- No staining or other adverse findings after 10 hours of wearing
- Over-Refraction:  
+0.25 Vacc 1.2p!!!



# Refractive Surgery



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# Case RP

- Patient RP 36-year-old Portuguese female
- Referred because of ectasia after LASIK
- Vasc:  $<0.1$
- Pre-LASIK correction was about -3.0dpt

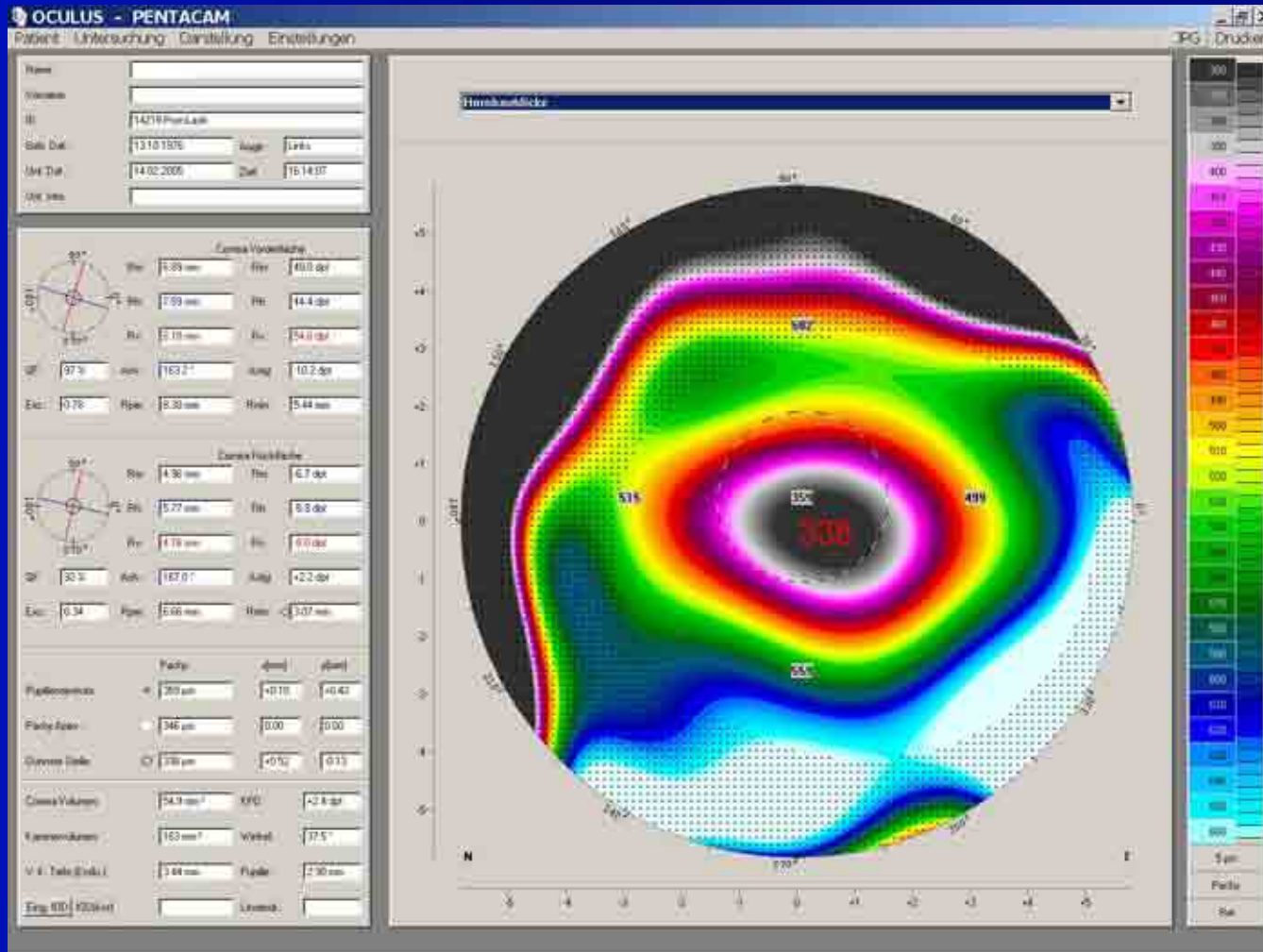


# Refractive Surgery

- Ectasia after LASIK often caused by a too thin residual bed thickness
- Retrospective Study: 325 micron!!
  - Flap thickness normally 160 micron
  - Leading in 485 micron over all thickness
  - 15 micron lasered per diopter
  - Highest possible correction with a cornea with 540 micron by -4.0 dpt



# Refractive Surgery



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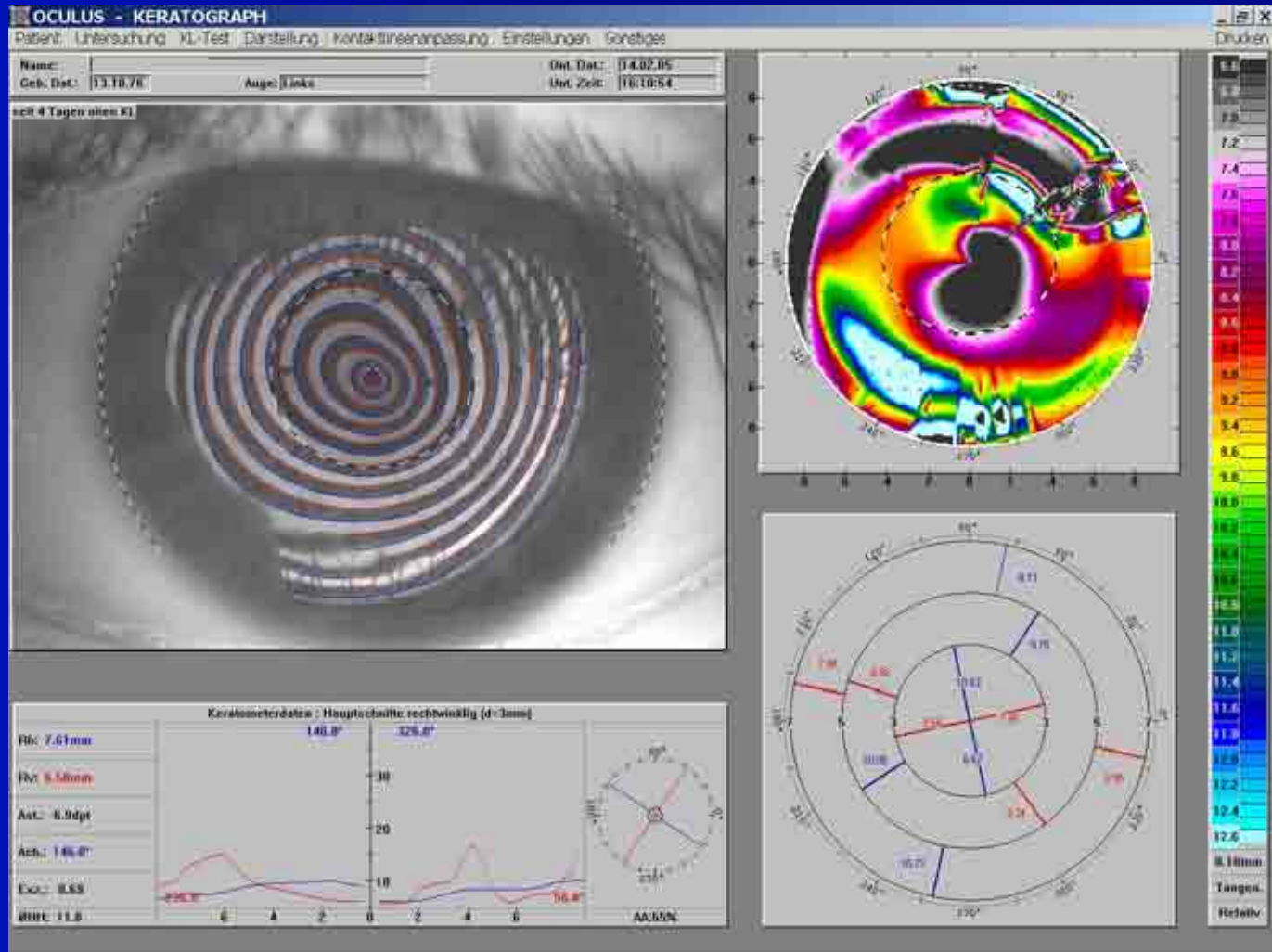


# Refractive Surgery

- Patient RP had gas permeable lenses since late 2004
- Because of dryness? the wearing time only a few hours
- So, one eye in the morning and the other eye throughout the afternoon



# Refractive Surgery

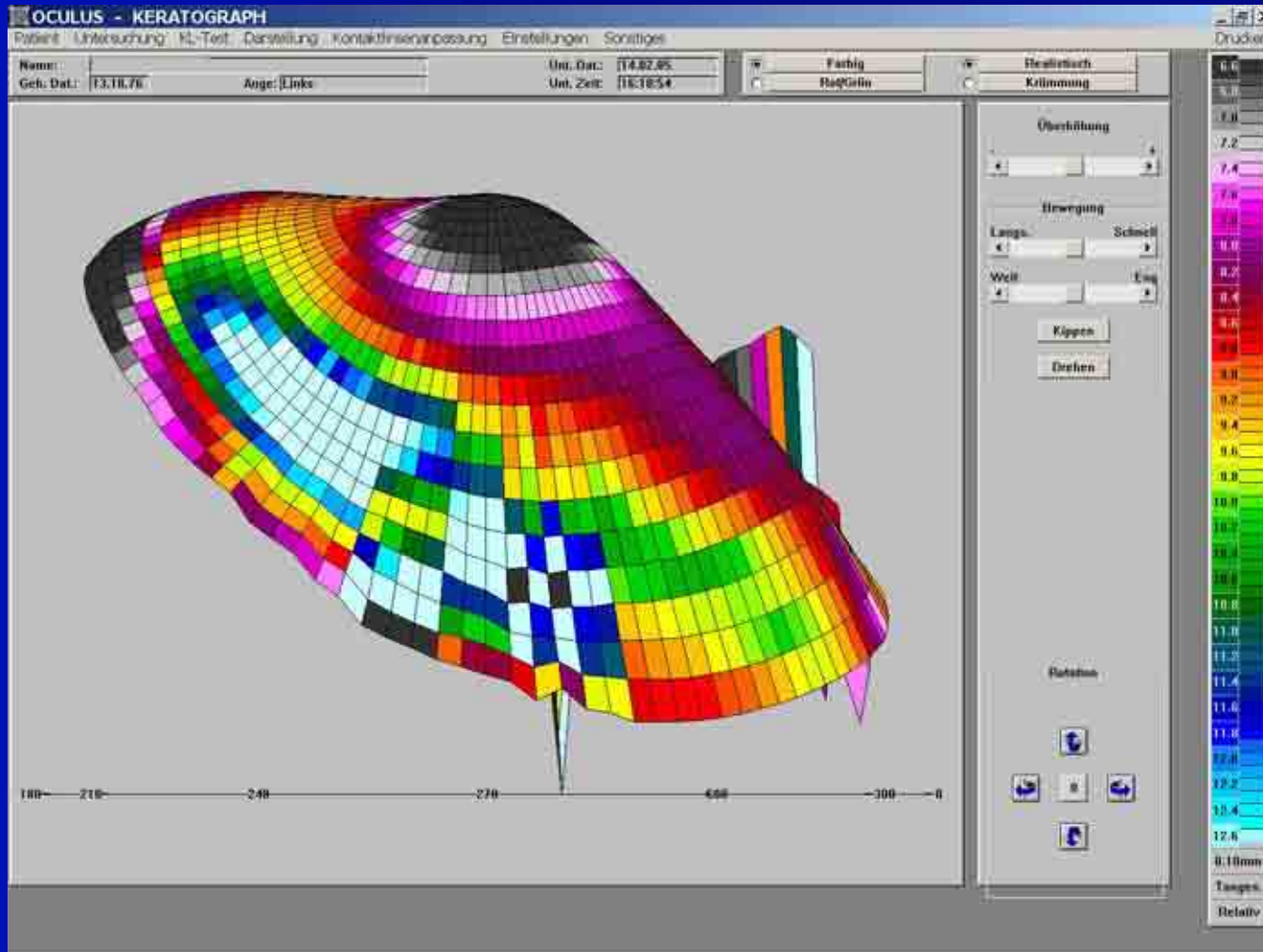


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# Refractive Surgery



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# Refractive Surgery

Falco, Switzerland

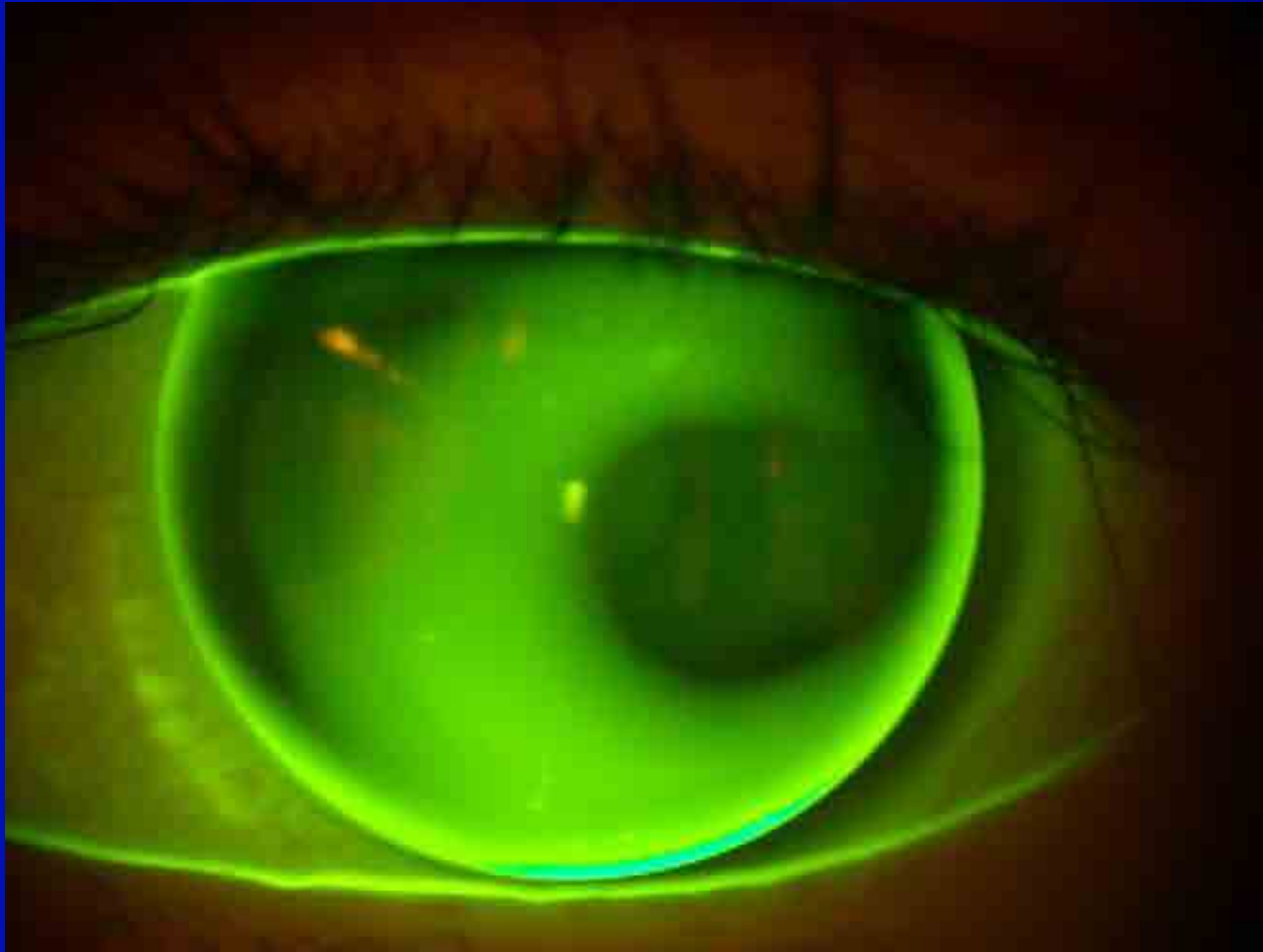
- Perit-0      nE 0.8      7.35 -6.75 dpt 11.2
- Perilimbale design to over-pass the irregular zone in the center and fit alignment in the periphery

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# Refractive Surgery



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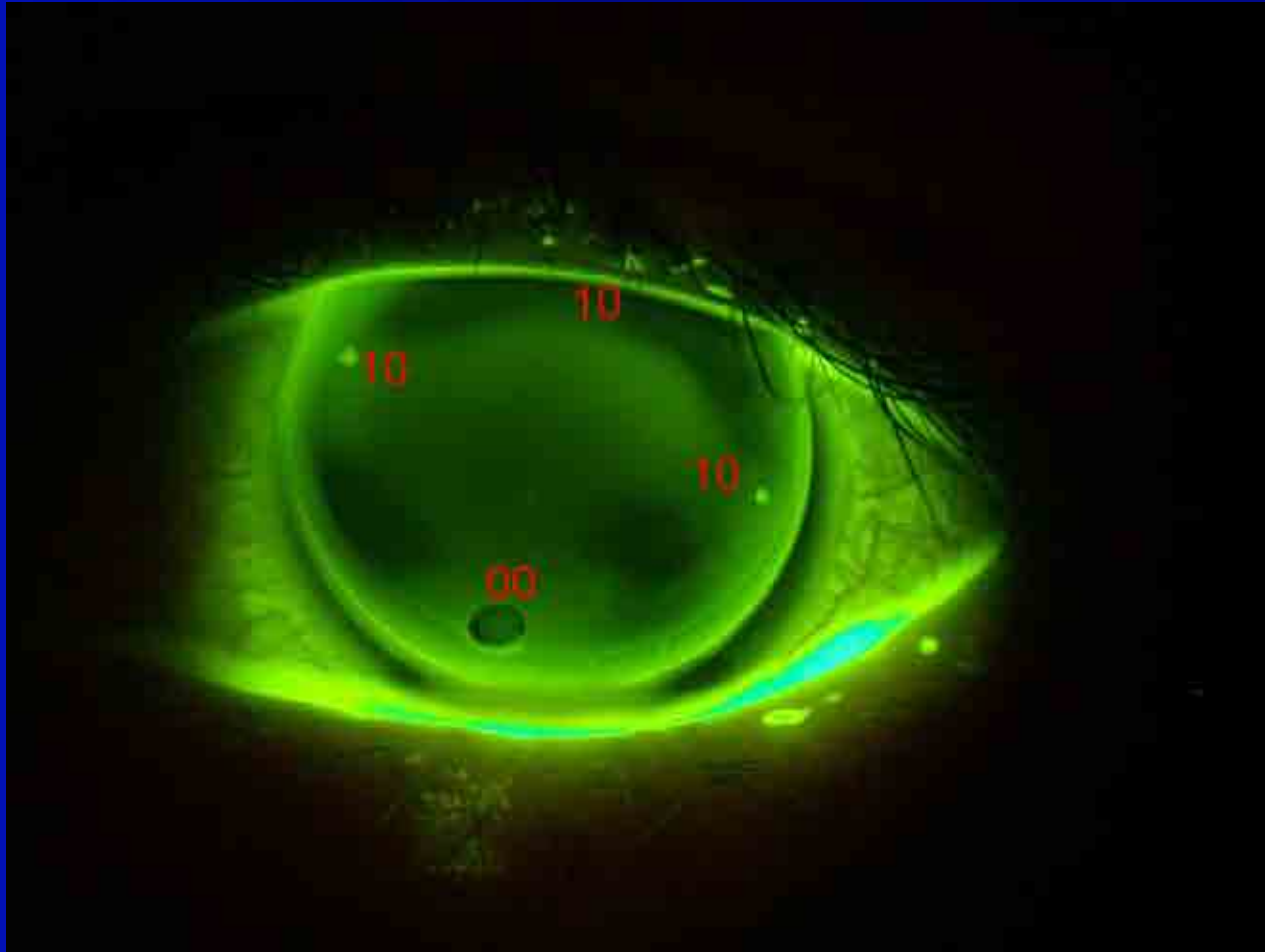
# Refractive Surgery

Falco, Switzerland

- FKQ / nE 10 10 10 00 / 7.10 -7.37 dpt
  - With Truncation of 2/10 mm in 90°
- Vacc: 0.5



# Refractive Surgery



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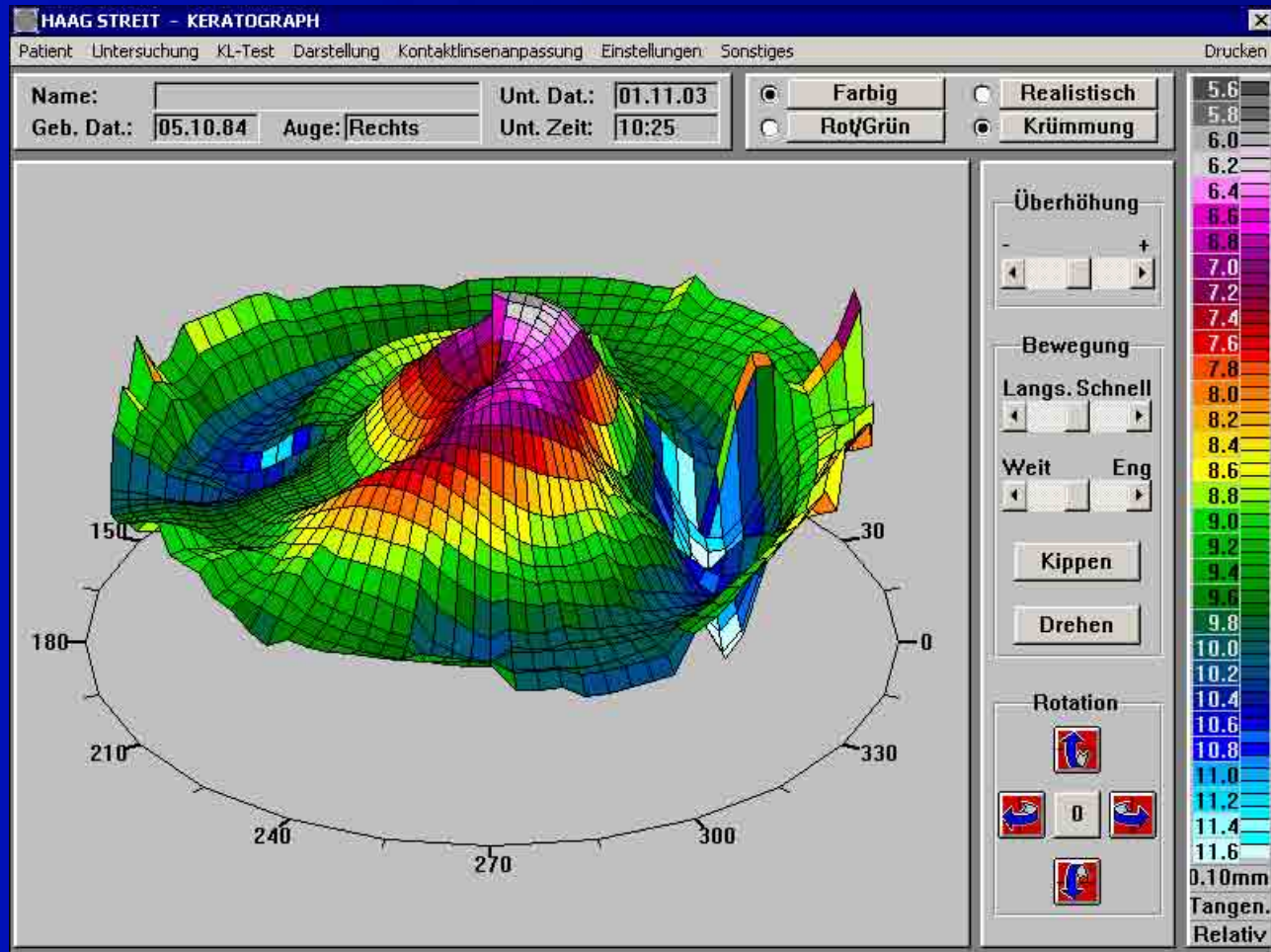


# Case GS

- Patient GS 19-year-old Caucasian female
- Referred because of suspicion of keratoconus
- Refraction:  
OD: +0.50D cyl −4.00D x 67°    Vacc 0.5  
OS: +1.50D cyl −3.50D x 65°    Vacc 1.0



# Case GS Right

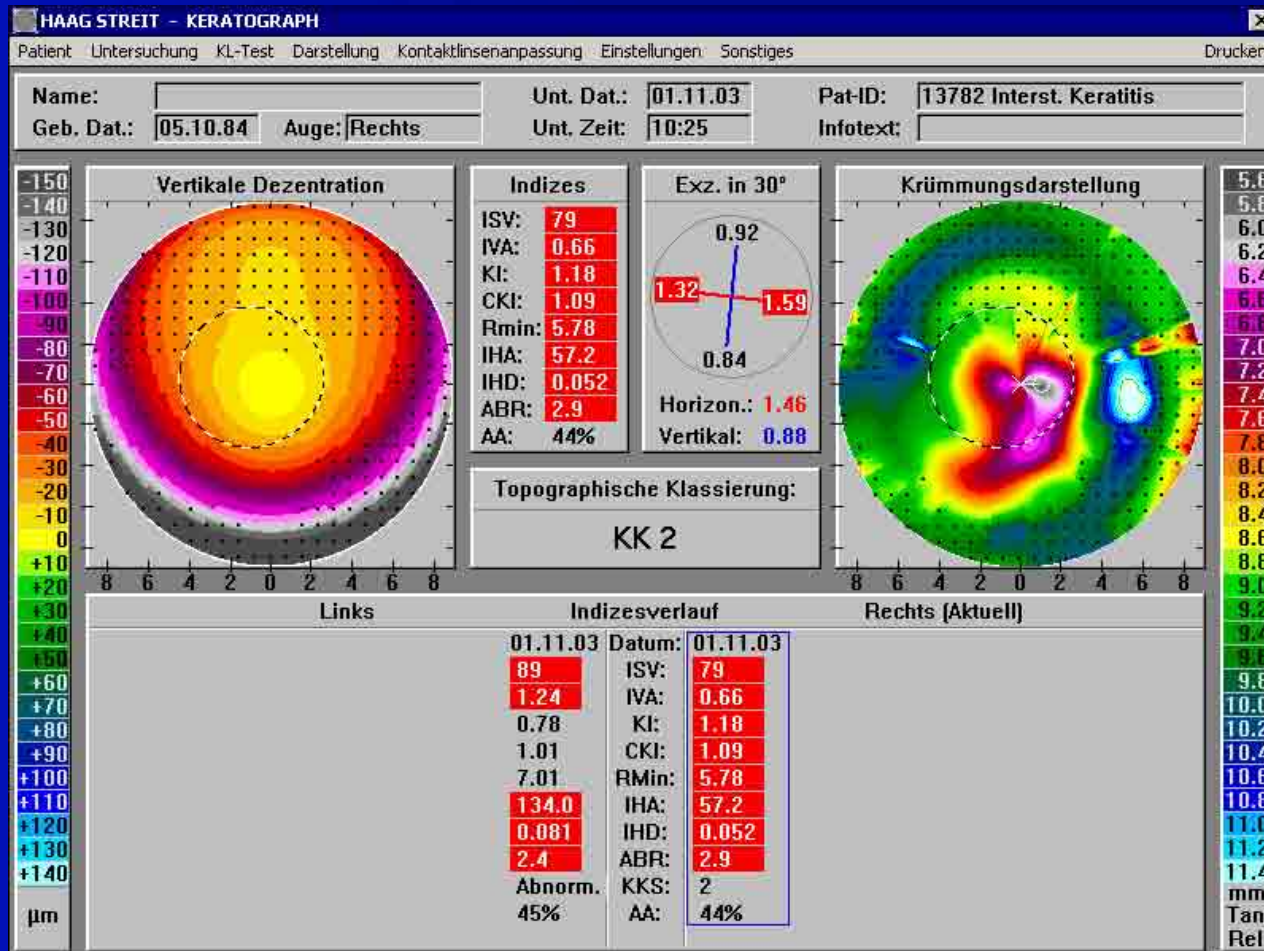


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# Case GS Right



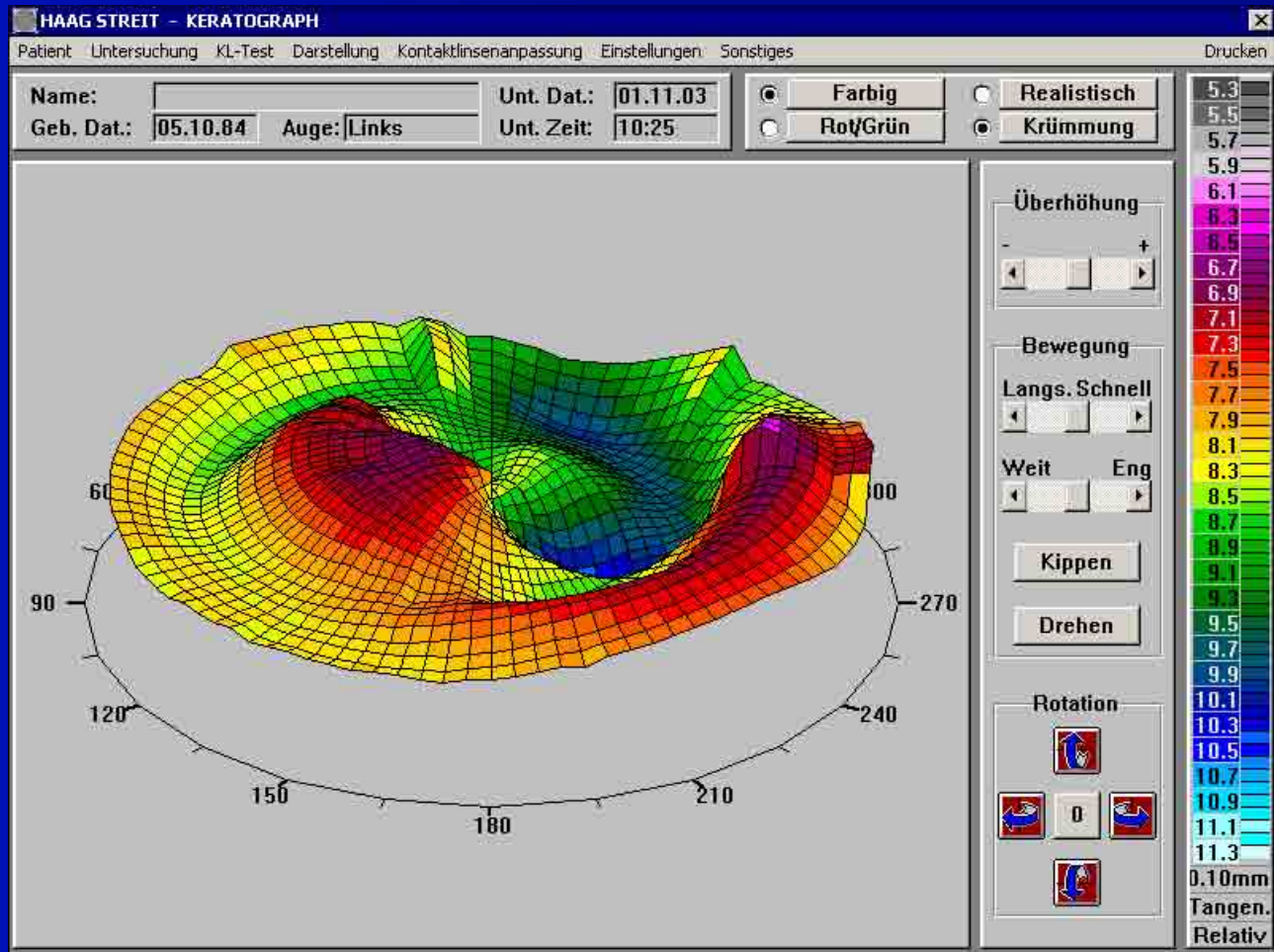
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# Case GS Left

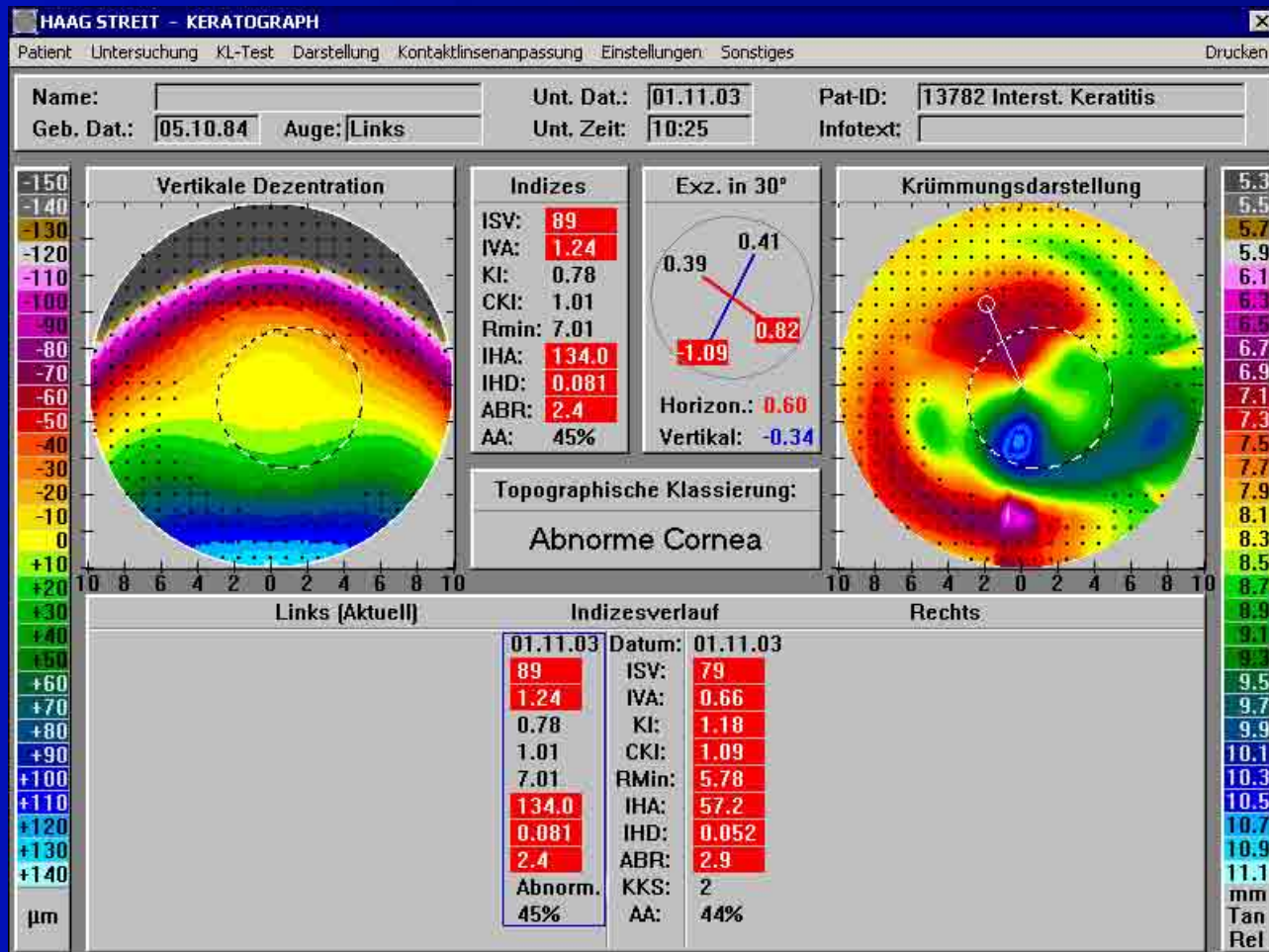


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# Case GS Left

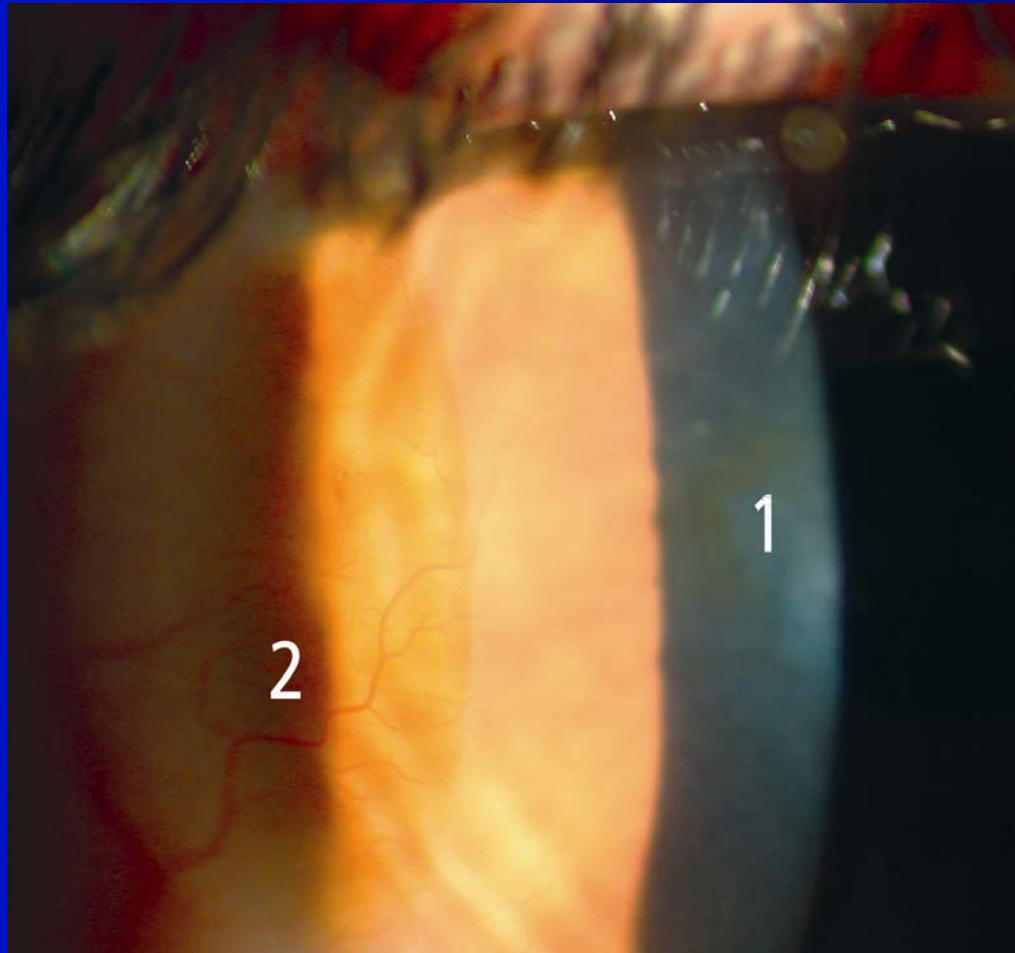


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# Case GS



- Ferritin deposits (1) along big vessels
- Deep stromal neovascularisation (2) partly as ghost vessels all over the cornea



# Interstitial Keratitis

- Patient had no Syphilis
  - Most cause for IK
- Gocan Syndrom was ruled out
  - No auditory defect after 2 years since onset
- Cause unknown, perhaps unmonitored wearing of disposables??





# Interstitial Keratitis

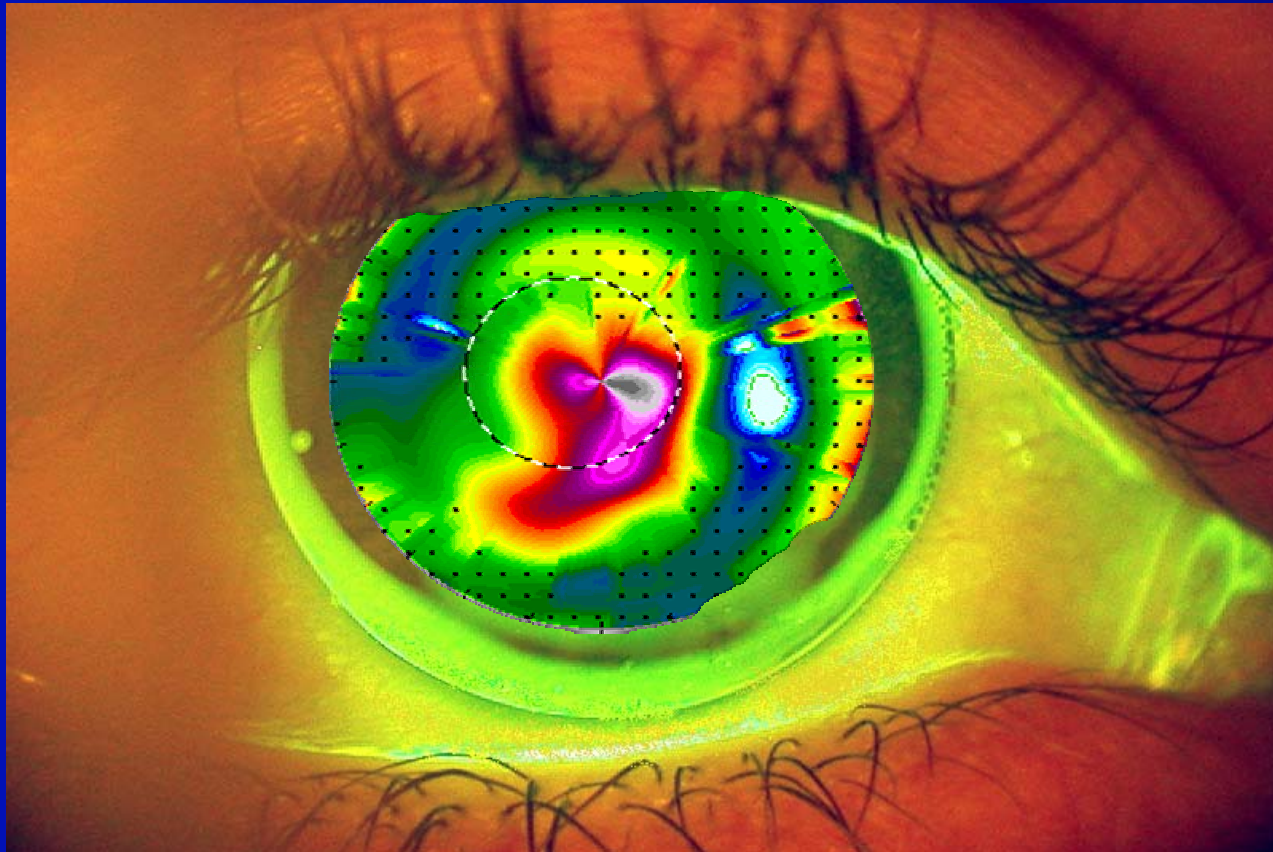
Falco, Switzerland

- Miniscleral SKA with Boston XO
- OD: 7.70    nE 0.5    diameter 12.65
- OS: 8.05    nE 0.5    diameter 12.65
- Vacc OU: 1.2 !!





# Interstitial Keratitis OD

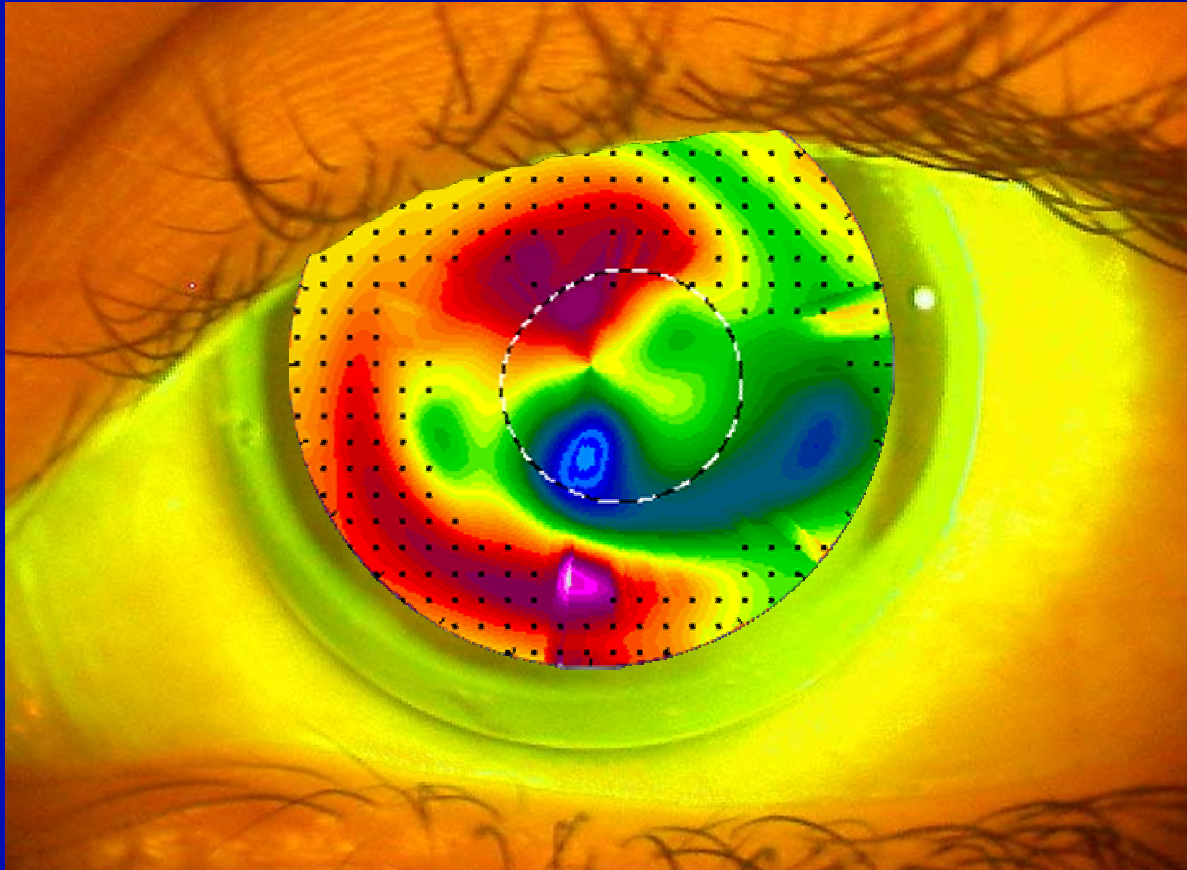


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# Interstitial Keratitis OS



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# Enjoy the meeting!



Monte Rosa, Zermatt, Switzerland

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