

How to avoid an unhappy patient after ISCRS implantation



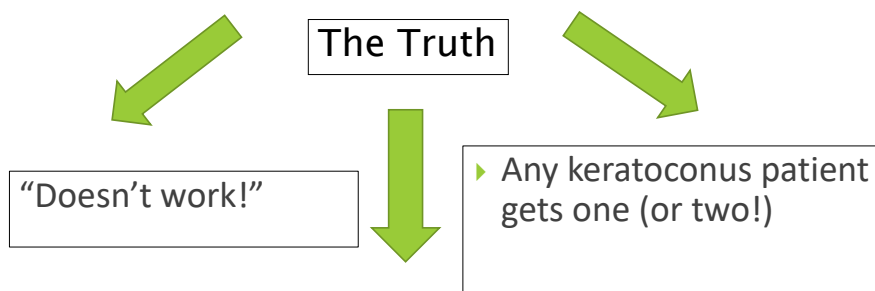
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 MEDICAL DIRECTOR, CAIRO UNIVERSITY EYE BANK

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Intrastromal Corneal Rings: Myth Versus Reality

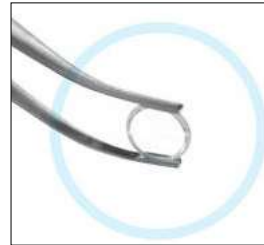
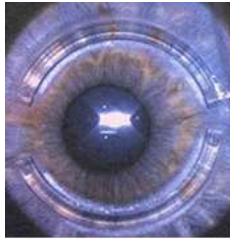
Still very controversial
 Two extremes of physician attitude:-



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PRESENTER'S EXPERIENCE

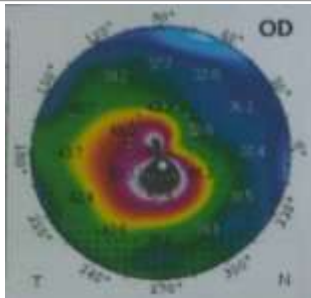


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How do rings improve vision?

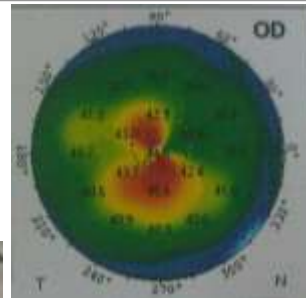
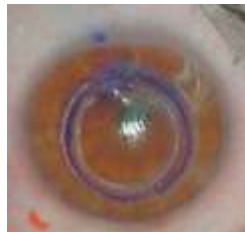
Steepen the periphery and flatten the center



Pre-op K's: 46.4/55.1 (50.1)

UCVA 20/400

Surgeon: Dr. Sameh El-Agha



Post-op K's: 40.4/46.4 (43.4)

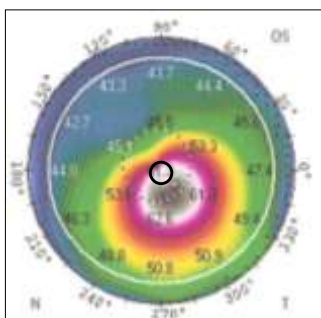
UCVA 20/40

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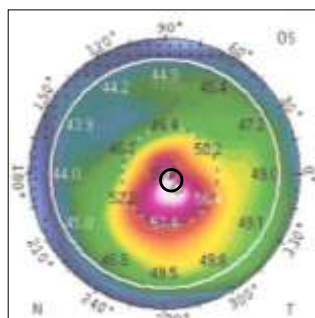
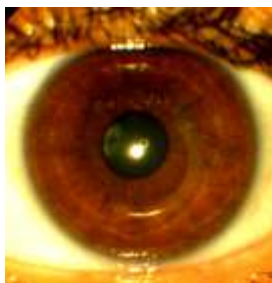
How do rings improve vision

Recentringing a sagging cone



K1 54.4 D / K2 57.1 D
Mean K: 55.7 D

UCVA 20/600



K1 52.7 D / K2 54.6 D
Mean K: 53.7 D

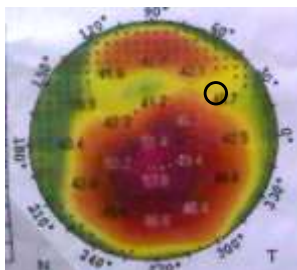
UCVA 20/50

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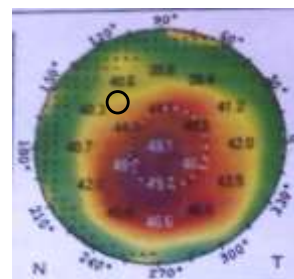
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How do rings improve vision



K1 46.7 / K2 50.5
Km: 48.5 D

UCVA 20/400



K1 46.7 / K2 48.2
Km: 47.5 D

UCVA 20/40

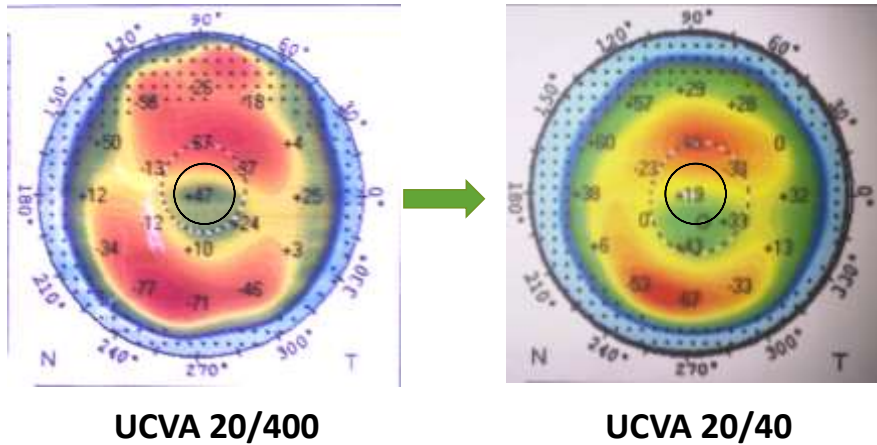
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Other mechanisms?

Reducing posterior elevation?



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Who are the unhappy patients after ISCRS implantation

- The case was too advanced
- The case was too early
- Incorrect refraction
- Large pupil diameter
- Improper depth of tunnel
- Improper incision placement
- Rings not placed along visual axis

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Who are the keratoconus patients who will benefit from intrastromal corneal rings

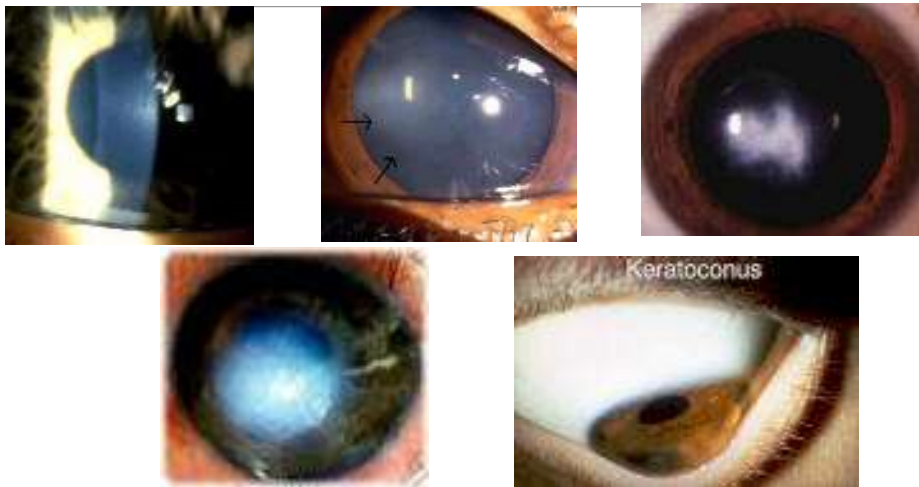
1. No apical scars
2. No stress lines (Vogts' striae)
3. No Fleischer rings
4. No breaks in descemet's membrane

THE CORNEA SHOULD LOOK ABSOLUTELY NORMAL AT THE SLITLAMP

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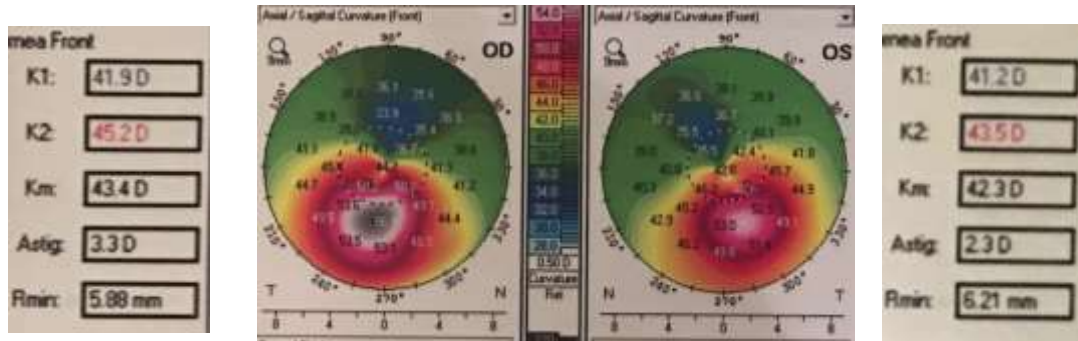
These patients will definitely be unhappy after ISCRS implantation!



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When are rings unnecessary?



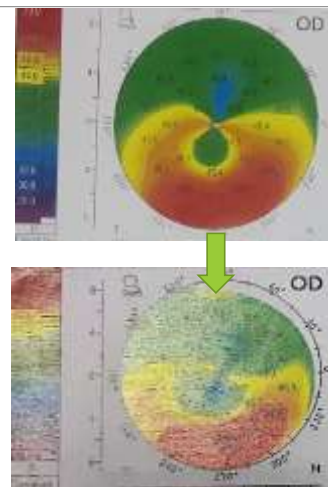
UCVA: 0.7 WITH EITHER EYE, 1.0 OU

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Unhappy patient after ISCR

- Post-LASIK ectasia
- Pellucid-like picture: most of ectasia outside the 5mm zone
- Mean K: 41.6 D (FLAT!)
- Result after single ring segment implantation:
 - Subjectively: "No change in my vision"
 - Minimal change in topographic pattern
 - Mean K: 40.2 D (EVEN FLATTER!)
 - Post-op MRx: Plano/+3.50 160°



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Case selection for intrastromal rings: visual parameters

- ▶ **Poor UCVA (20/200 or less):**
Wow effect can be almost like LASIK
- ▶ **BCVA at least 20/50 (or 20/80)**
- ▶ **Manifest cylinder > 3D**

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Tips regarding refraction of the keratoconus patient

- PURELY SUBJECTIVE
- Previous spectacles may be a good starting point
- Stenopaic slit can be very helpful
- Get the steep axis from the topography



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Beware of autorefractometer!

UCVA : 20/400 OU

MRx:

- OD: plano/ -7.00 x 40° → 20/50
- OS: plano / -6.00 x 120 → 20/50

Note the amount of error in:-

- Magnitude of sphere and cylinder
- Spherical equivalent
- Axis of cylinder

Autorefractometer printout showing refractive error data for both eyes. The printout includes patient information, refractive data, and cylinder mix data.

REF. DATA			
VD:	12.00	CYL:	MIX
<R>	S	C	A
	-10.50	-7.50	45
	-8.75	-7.50	45
	-8.50	-7.50	40
	-8.25	-7.75	40
	-8.25	-7.50	40
	-8.50	-7.50	40
S. E.	-12.25		
<L>	S	C	A
	-8.00	-1.75	180
	-8.00	-1.75	180
	-7.75	-2.00	155
	-8.00	-2.00	155
	-8.00	-2.25	155
	-8.00	-2.00	155
S. E.	-9.00		
PD:	61		
TOPCON			

Tips regarding refraction of the keratoconus patient

- Tell the patient, "I know that glasses are useless in your case, but I need to take some measurements to know the right rings for you"
- Use the trial frame to "stack" cylinder (the nomograms for the Kerarings go up to -8.00 cylinder)

Ring selection (Kerarrings)

- Based on manifest refraction and type of cone
- Other types of nomograms:-
 - Based on asphericity (Q-value)
 - Based on axis of vertical coma

Preoperative planning: KERARINGS



Ectasia type 1 : Nomogram A

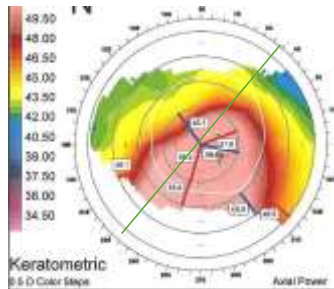
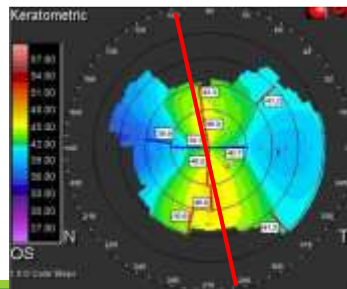
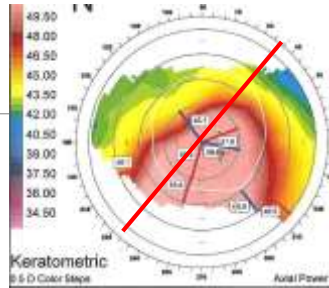
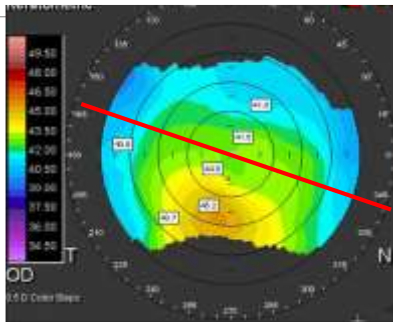


Ectasia type 2 : Nomogram B



Ectasia type 3 : Nomogram C

Actual examples

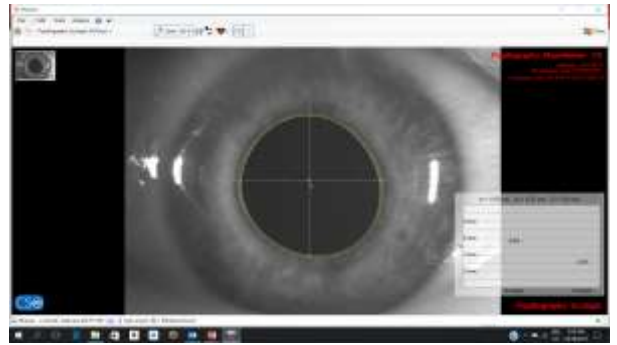


HOW DO WE USE THE NOMOGRAM?

- Ectasia Type 2
- We use Nomogram B
- Ref.: -3.25 DS/ -4.25 DC x145°
- Steep meridian: 55°
- Two 160° rings, 150µ and 250µ

	90°/150µ	90°/150µ	90°/150µ	90°/150µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/250µ
	90°/250µ	90°/250µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/350µ
-8	90°/150µ	90°/150µ	90°/150µ	90°/150µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/200µ	90°/250µ
-7	90°/250µ	90°/250µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/300µ	90°/350µ
-6	90°/150µ	90°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/150µ	120°/200µ
-5	90°/250µ	90°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/300µ
-4	90°/150µ	90°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/200µ
-3	90°/250µ	90°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/250µ	180°/300µ
-2	90°/150µ	90°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/150µ	180°/200µ
-1	210°/150µ	210°/150µ	210°/150µ	210°/150µ	210°/200µ	210°/200µ	210°/200µ	210°/200µ	210°/200µ	210°/200µ	210°/200µ	210°/250µ
	210°/250µ	210°/250µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/300µ	210°/350µ
	>0	-1	-2	-3	-4	-5	-6	-7	-8	-9	-10	

Mesopic pupil diameter

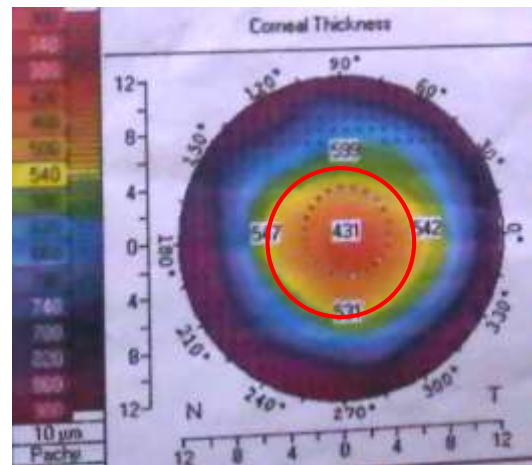


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Role of corneal thickness in decision-making process

- ▶ Central corneal thickness is of no consequence
- ▶ Look at the corneal thickness in the 5-mm zone



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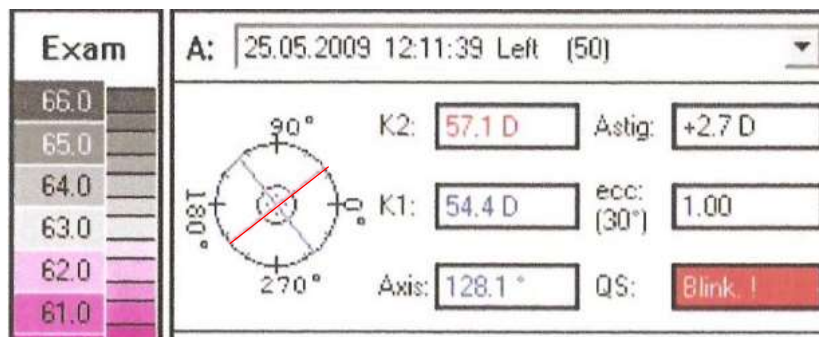
Proper tunnel depth selection

Proposed Segment Thickness	150 μm	200 μm	250 μm	300 μm	350 μm
Minimum Corneal Thickness Required at the implantation tunnel area	250 μm	335 μm	420 μm	500 μm	580 μm

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Incision placement: topographic vs. refractive cylinder



Manifest refraction: plano/-6.00 x120

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Patient expectations: how do you counsel the patient

Two things **not to say**:-

- “We are going to make it easier to fit you with a contact lens”
- “After surgery, your glasses will be thinner.”

	Pre-op	Post-op
UCVA	20/600	20/50
MRx	-1.50/-4.50 x 30°	-1.00/-2.50 x 30°
BSCVA	20/50	20/30
SE	-3.75	-2.25

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How do you counsel the patient

The real benefit is improvement of UCVA

Another secondary benefit is improvement of BCVA (but most patients don't care!)

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Intraoperative considerations: Importance of Marking Visual Axis

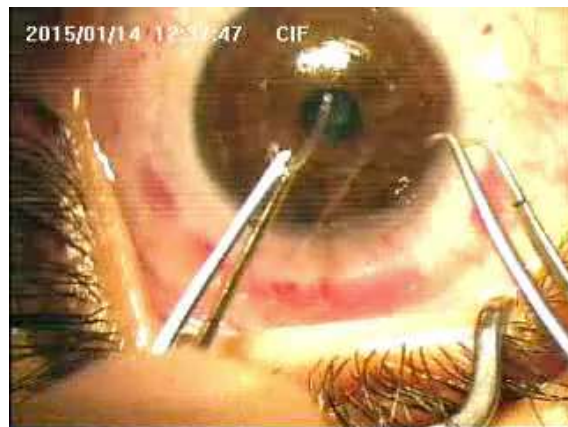


Surgeon: Dr. Sameh El-Agha

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Intra-operative considerations: Implant rings right side up!



Surgeon: Dr. Sameh El-Agha

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Sum-up: how to avoid patient dissatisfaction

- Proper case selection
 - Not too mild, not too severe
- Proper pre-operative planning
 - Reliable subjective refraction
 - Proper selection of arc length and thickness of ring segments
 - Calculation of tunnel depth
 - Axis of incision
- Adjusting patient expectations
- Proper execution of surgery
 - Centering tunnels on visual axis
 - Proper orientation of rings (apex up)

Thank you for you kind
attention