

### CORRECTING EXTREMELY HIGH MYOPIA BY COMBINING STANDARD WITH ADVANCED IOL TECHNIQUES FOR A LIFE WITHOUT GLASSES

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### NO FINANCIAL INTEREST IN ANY OF THE PRODUCTS MENTIONED.

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- 67 years old / female / very unhappy and depressed with poor vision in both eyes
- Difficult conditions like cataracta nigra, high myopia / macular degeneration
- Turned away by other institutions

Refraction	OD OS	-21,0 -21,5	-1,5 -0,25	/ 18° / 130°			
UCVA	OD OS	hand m hand m	ovements ovements				
BCVA	OD OS	< 0,05 hand m	ovements				
Axial length	OD OS	31,23 m 32,37 m	וm וm				



### PATIENT PENTACAM PREOPERATIVELY

## OD





### PATIENT PENTACAM PREOPERATIVELY

OS





#### PATIENT RETINA PHOTOGRAPHY PREOPERATIVELY

# OD

• blurred by cataract / dry macula / central staphyloma



Signature :

Date :



#### PATIENT RETINA PHOTOGRAPHY PREOPERATIVELY

# OS

• blurred by cataract / dry macula / central staphyloma



comments :
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Signature :

Date :



- Cataract surgery
- Visual acuity after surgery without glasses at all distances
- Binovision with Light Adjustable Lens (LAL)

### **BACKGROUND LAL**



- Light Adjustable Lens made of photosensitive silicon which changes shape in response to ultraviolet light and improves patients visual acuity
- Light Adjustable Lens is available between +10 to +30 D
- Light Adjustable Lens has a UV-blocker



### **BACKGROUND LAL**



- Light Delivery Device allows to change the lens power postoperatively up to +/- 2,0 D
- Light Adjustable Lens seems to create asphericity and large depth of field (depth perception)





### iTrace demonstrates good Depth Perception of Calhoun LAL



With a large aperture (Iris) a sharp image depends on the optimized curvature (asphericity) of the lens.



### Ray Tracing Aberrometry (Tracey iTrace) was done before and after Light Adjustment.







- From October 2008 until February 2014 I have implanted the LAL into 531 eyes
- In our clinic we use the possibility of modification of asphericity of the LAL by special adjustments (Binovision)
- It is a highly satisfying alternative for patients who desire presbyopia correction and seeing at all distances without glasses



### **Rayner Sulcoflex Pseudaphakic Supplementary IOL**

- was developed, because today's cataract patients expect more than clear vision after cataract surgery. They expect refractive results close to emmetropia and independent from spectacles.
- is designed to be implanted in the ciliary sulcus to correct any residual pseudophakic ametropia.
- For optimal optical performance Rayner uses an aberration neutral aspheric optic technology.





- Phakoemulsification in both eyes
- Implantation of a +10 D LAL into both eyes (+10 D is the lowest commercially available power of the LAL)
- Patient would have needed -3,0 D / -1,0 D
- Simulation of proposed treatment results with accessory lenses to demonstrate visual acuity (far, intermediate, near) and depth perception after proposed adjustment of the LAL

METHOD

 Adjustment of the LAL using Binovision principles (technique developed in our clinic) for seeing near, intermediate and far without glasses



Secondary implantation of Rayner Sulcoflex Pseudophakic Supplementary IOLs into both eyes to achieve full refractive compensation.

Example for calculation OD

Rayner Sulcoflex model 653L

Input data for IOL calculation:

Surgeon-ID (e-mail address)		info@pau					
Patient-ID:		NN		Eye:	OD ®	OS	0
Current refraction	sph [D]	-5			cyl [D]	0	
Vertex distance	VD [mm]	12.06					
Pseudophakic ant. chamber depth	AC [mm]	4.17					
Measured corneal radius #1	R1 [mm]	7.68	/ corneal radius	#2 R2	[mm]	7.55	
Target refraction	Rx [D]	0.00					

#### 🛦 Rayner Sulco*flex* model 653L 🔺

Secondary piggy back calculation for a pseudophakic eye

Surgeon	ID:	info@paulig-augenklinik.de	
Patient ID: Patient eye:		NN	
		OD	
Patient d	ata		
sph	[D]	-5.000	
cyl	[D]	0.000	>
VD	[mm]	12.06	
AC psph	[mm]	4.17	
Rl	[ <b>mm</b> ]	7.68	
R2	[mm]	7.55	

IOL [D]	Rx [D]
-4.0	-1.63
-4.5	-1.23
-5.0	-0.84
-5.5	-0.45
-6.0	-0.06
-6.5	0.32
-7.0	0.70
-7.5	1.07
-8.0	1.43

**METHOD** 

03.03.14 / 13.25.41

RaynIOL - H0.3 (C) 2008 W.Haigis, Univ.Eye Hospital, D-97080 Wuerzburg, Germany



Secondary implantation of Rayner Sulcoflex Pseudophakic Supplementary IOLs into both eyes to achieve full refractive compensation

Example for calculation OS

Rayner Sulcoflex model 653L

Input data for IOL calculation:

Surgeon-ID (e-mail address)		info@pau				
Patient-ID:		NN		Eye:	od 🔘	os 🖲
Current refraction	sph [D]	-7			cyl [D]	0
Vertex distance	VD [mm]	12.36				
Pseudophakic ant. chamber depth	AC [mm]	4.35				
feasured corneal radius #1	R1 [mm]	7.8	/ corneal rad	lius #2 Ri	2 [mm]	7.62
Target refraction	Rx [D]	0.00				

🛦 Rayner Sulco*flex* model 653L 🔺

Secondary piggy back calculation for a pseudophakic eye

Surgeon	ID:	info@paulig-augenklinik.de		
Patient ID: Patient eye:		NN		
		OS		
D. (*				
Patient	data			
sph	[D]	-7.000		
cyl	[D]	0.000		
VD	[mm]	12.36		
AC pspl	h [mm]	4.35		
R1	[mm]	7.80		
R2	[mm]	7.62		

IOL [D]	Rx [D]
-6.0	-1.81
-6.5	-1.42
-7.0	-1.02
-7.5	-0.64
-8.0	-0.25
-8.5	0.13
-9.0	0.50
-9 <mark>.5</mark>	0.87
-10.0	1.24

**METHOD** 

03.03.14 / 13.28.06

RaynIOL - H0.3 (C) 2008 W.Haigis, Univ.Eye Hospital, D-97080 Wuerzburg, Germany



### MOVIE IMPLANTATION SULCUFLEX BLABLA







Refraction after Phacoemulsification both eyes	OD -7,25 OS -10,0	-1,75 / 105° -0,5 / 108°	
Refraction after adjustment and lock in both eyes	OD -6,0 OS -8,0	-0,75 / 96° -0,25 / 120°	
Refraction and UCVA/BCVA after secondary implantation of Rayner Sulcoflex IOL into both eyes	OD -0,5 OS -0,75	-0,5 / 102° -0,25 / 110°	
UCVA	OD 0,7 OS 0,32	ND I ND X (AMD OD <os)< th=""><th></th></os)<>	
BCVA	OD 0,8 OS 0,32	ND I ND X (AMD OD <os)< th=""><th></th></os)<>	



#### PATIENT PENTACAM POSTOPERATIVELY

OS





#### PATIENT PENTACAM POSTOPERATIVELY

OD





#### PATIENT RETINA PHOTOGRAPHY POSTOPERATIVELY

# OD

dry macula / central staphyloma



Comments :

Augenklinik / Praxis

Signature :

Date :



#### PATIENT RETINA PHOTOGRAPHY POSTOPERATIVELY

## OS

dry macula / central staphyloma



Comments :

Augenklinik / Praxis

Signature :

Date :







- Patient can see and work at all distances without glasses
- Patient is able to legally drive a car again without glasses
- Patient has UV protection for her destroyed macula

Patient is very happy



- The Light Adjustable Lens offers valuable possibilities to correct patient's outcome after cataract lens refractive surgery.
- Binovision adjustment is the best option after LAL implantation, if patients ask for adequate near, intermediate and distant vision in the same eye without glasses. Additionally these patients have great stereoscopic binocular vision at all distances and a large depth of field including UV protection.
- The vision is superior compared to that provided by other refractive methods presently used.
- Because of LALs limited commercially available power we need to combine a second method in some cases.
- Implanting a second, sulcus fixated supplementary lens is a safe solution to improve the UCVA close to emmetropia.



- The combination of the standard with the advanced IOL technique is an excellent and safe option for almost all patients who are looking for a life without glasses.
- An additional combination using special Binovision adjustments, improves patients depth of field and stereoscopic vision and provides excellent near, intermediate and far vision without glasses.
- All together it is the pink of perfection and the answer we have been all waiting for.



### THANK YOU FOR YOUR ATTENTION

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