American Society of Cataract and Refractive Surgery

17-21 April, 2015
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San Diego Convention Center

Course 2703
Session 20-302
Room 6 B

“Best Management of Cataract Surgery in Complicated Eye”

Senior Instructor:
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Richard L. Lindstrom MD
Robert Osher MD
Matteo Piovella MD

Monday, April 20, 2015
1.00 PM – 2.30 PM
Refining Refractive Error Post premium IOLs  
Matteo Piovella MD  
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Multifocal Accommodative and Toric IOL Implantation in Advanced cataract Surgery: 8 Years Up to date  
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Long Term Management of Refractive Outcomes After RK  
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“Refining Refractive Error Post premium IOLs”
Matteo Piovella MD
Phakic IOL Removal

Phakic IOL PRL removal 4 years p.o.

Vivarte™ IOL Removal

Thank you for your attention
“Multifocal Accommodative and Toric IOL Implantation in Advanced cataract Surgery: 8 Years Up to date”
Matteo Piovella MD
Weak Points of Diffractive Multifocal IOLs

- Reduction of Contrast Sensitivity (up to 30%)
- Diffraction Grooves (Bake Night) Creates Different Diffraction Efficiency and Light Loss
- Tonic Multifocal when 0.75 D of Corneal Astigmatism
- Mark, Glare and Ghost Images are Difficult to Manage in Susceptible Patients
- Poor Intermediate Distance Vision
- 6.50 Diopter SE generates less of one line of Visual Acuity
- Perfect Target: Piano Postop Refractive Results

Bilateral Tecnis® MIOL
22 eyes of 15 patients
Mean Age 58.63±5.30

Yag Laser Treatment
52 Patients with ReZoom® + Tecnis® Implantation (104 eyes)
10 Patients with Bilateral Tecnis® Implantation (22 eyes)

Monocular defocus curve Multifocal IOL
Tecnis® AMO ABBOTT

Rays and Wavefront

Lens REFRACTS light ray = TRANSFORMS wavefront shape Rays and Wavefront

The key advantage of Wavefront over Rays is that the wave nature of light can be introduced with the Wavefront and then the image is formed by constructive interference of the light waves.

Image in a constructive interference of wave

Plane wavefront (object at infinity)

Spherical wavefront

**Synergy Dual Optics AIOL - 2 Years Clinical Results**

- 33 eyes of 18 patients
- Mean Age 71.52 ± 7.62
- Mean Preoperative BCVA: 0.67 ± 1.51
- Mean Time Follow Up Days: 784.43 ± 145.38
-Mean Preoperative Sphere Equivalent: 0.46 ± 1.42
- Incision Size: 3.75 mm using calibrate metal knife

**Monocular defocus curve Synergy Dual Optics AIOL**

**Accommodating IOLs Best**

- No Contrast Sensitivity Penalization
- Halos or Glare similar to Monofocal IOLs
- Future AMD: No Future Visual Penalization due to IOLs Technology
- Best Choice for Susceptible Patient, with Possible High Sensitivity to Glare and Measles, but Highly Demanding for New Technology IOLs
- Provide Intermediate Vision

**AT LISA® tri Trifocal Optic**

- The optical zone of the AT LISA® tri in 0.8mm provides:
  - a near addition of +0.33 D for a comfortable reading distance
  - an intermediate addition of +1.68 D
- Improves intermediate vision without compromising near or far vision.

AT LISA® tri has fewer rings as the IOL optic surface for reduced potential visual disturbances and improved night vision.
AT LISA® tri (Zeiss)
Specific Asymmetrical Light Distribution

AT LISA® tri: asymmetrical light distribution:
- 50% far
- 25% intermediate
- 25% near
This technology decreases light loss

<table>
<thead>
<tr>
<th>LIGHT DISTRIBUTION</th>
<th>NEAR</th>
<th>INTERMEDIATE</th>
<th>FAR</th>
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<tr>
<td>Outside Range of Vision</td>
<td>30%</td>
<td>20%</td>
<td>50%</td>
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AT LISA® tri Materials and Methods

- AT LISA® tri implanted in 76 eyes of 46 patients
- Mean Age: 64.22 ± 16.22
- Mean Preoperative BCVA: 0.77 ± 0.27
- Mean Time Follow Up: 734.26 ± 83.16 days
- Mean Preoperative Sphere Equivalent: 0.44 ± 2.31

UCVA – BCVA and Sphere Equivalent (76 Eyes)

AT LISA® tri
Near Monocular Vision (EDTRS)

UCVA

BCVA

AT LISA® tri
YAG Laser Treatments

- AT LISA® tri implanted in 76 eyes of 46 patients
- 3 Eyes: YAG laser treatments (4.0%)
- Mean days PO: 356.20 ± 123.30 days

AT LISA® tri YAG Laser Materials and Methods

- AT LISA® tri implanted in 40 eyes of 24 patients
- Mean Age: 60.00 ± 14.79
- Mean Preoperative BCVA: 0.76 ± 0.26
- Mean Time Follow Up: 573.75 ± 15.38 days
- Mean Preoperative Sphere Equivalent: 1.15 ± 3.04
- Mean Preoperative Corneal astigmatism: 1.16 ± 0.41
- Mean Preoperative Retrospective Astigmatism: 0.60 ± 0.83
Quality of Vision
Contrast Sensitivity and Control Values

Control values for CS are derived from Hohberger paper

- 10-14 healthy phakic subjects for the following age groups:
- Functional Image Analyzer OPTEC® 6500P
- Daytime (65 cd/m²), Nighttime (3 cd/m²), and Nighttime with Glare (3 cd/m²)
- Monocular testing
- Paper demonstrated strong age dependence of CS with age
**Surgery performed:**
on July 2nd 2014 (Right Eye - 2011 RD)
on July 4th 2014 (Left Eye)

**Preoperative data:**
- Right Eye: BCFV 20/25
- Left Eye: BCFV 20/25

- Right Eye: +8 sph
- Left Eye: +8 sph – 1.50 cyl axis 185°

**Two Months PO Results:**
- Right Eye: UCFV 20/15 UCV 20/25 UCNV 20/12 (Bright Light)
- Left Eye: UCFV 20/15 UCV 20/25 UCNV 20/12 (Bright Light)

**Conclusions:**

- **Bifocal Diffractive IOLs Technology** is helpful to manage in order to avoid the quality of vision pansionization in a significant number of patients. Diffractive diffractive IOLs technology may have significant of light for intermediate distance and an important amount of light.
- The Trifocal Diffractive IOLs technology addresses this weak point providing specific % of light for intermediate distance and reduces the light loss % improving diffractive efficiency and quality of vision.
- Mirrors, Glass, and glass imaging are difficult to manage in demanding patients. Diffractive Diffractive IOLs technology is an effective tool to reduce night driving problems due to non-symmetric % of light distribution.
- A mm pupil size condition works at the best to minimize patient complaints. Larger pupils have to be detected preop.
- Perfect Target after Diffractive IOLs Technology Implantation is Plane Postop nucleus.
Conclusions

- Due to loss of contrast sensitivity (up to 30%) we provided to our patients a small led high power light to get Jaeger 1 near vision in dim light condition.
- After advanced technology cataract surgery patients are not penalized by evident differences in their vision but they need practical directions to overcome any possible visual weak points.

Thank you for your attention!
“Long Term Management of Refractive Outcomes After RK”
Matteo Piovella MD;
Left Eye IOL Calculation

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Capsulorhexis

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Injection

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Nucleus Removal

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Cortex Removal

Results

- Left Eye IOL Implanted +30.50 AT LIGA tri
- Right Eye IOL Implanted +29.00 AT LIGA tri

- 1 Month post Surgery
  - RE BCFV 20/20 +2.00 DIF +1.50 CYL AX 15°
  - LE BCFV 20/20 +3.50 DIF +2.00 CYL AX 40°

- 3 Months post Surgery
  - RE BCFV 20/20 +2.50 DIF +1.00 CYL AX 20°
  - LE BCFV 20/20 +2.50 DIF +2.00 CYL AX 40°
Left Eye : 3 Months PO

Case Presentation 2

Female 56 y.o.

RE CK 1975 CHERATOCONUS
LE OCULAR TRAUMA

April 2014
RE BCFV 53/20 -12.00 CYL AX 60°
LE BCFV 63/20 -7.00 SF -8.00 CYL AX 60°

Planned Surgery

- Female 56 y.o.

May 2014

RE Femto Laser Assisted Cataract Surgery
using Catalys System (AMO Abbott)

RE AT TORBI IOL Implantation (Zeiss Meditec) :
Toric Monofocal IOL +9 sf +12.00 cyl ax 146°

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Nucleus Removal

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
IOL Implantation
Results

Right Eye AT TORBI IOL Implantation +9 sf +12.00 cyl ax 145°

1 Month post Surgery
- RE BCFC 40/20 -3.00 SF +6.00 CYL AX 160°

- 3 Months post Surgery
- RE BCFC 40/20 -2.00 SF +6.00 CYL AX 160°

Left Eye 3 Months PO

Thank you for your attention
## ADDRESSES

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