American Society of Cataract and Refractive Surgery

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San Diego Convention Center

Course 2603
Session 21-103
Room 6 C

“Best of the Best : Advanced New Technologies Cataract Surgery”

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Tuesday, April 21, 2015
8.30 AM – 9.30 AM
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“Femto Laser Assisted cataract Surgery: Virtuosity or Frontier?”
Matteo Piovella MD
Use of Premium IOLs - US Cataract Surgeons

Laser Cataract Surgery
Projected to grow to 1.76M procedures by 2017

Where is the barrier to entry?

Refractive Cataract Surgery

Figure S1: Greatest Concerns over LRCS

- New skill needed
- Efficiency
- Increased chair time
- Reduced OR efficiency

52%
0%
20%
40%
60%
80%
100%
Source: 2016 American Society of Cataract Refractive Surgeons

The laser is part of a tool set required to enhance procedural predictability

- Establish medical necessity to perform cataract surgery
- Discuss refractive goals of the patient
  - Does the patient desire to depend less upon glasses after surgery?
  - If yes, then the cataract surgery becomes a refractive procedure

Four Key Points Influencing Cataract Surgery

- More demanding patients for new technology adoption
  - Patient mean age
  - From 72 y.o (1970-1980) dropped down to 62.6 y.o
- More precision, safety and reproducibility
  - Corneal incisions
  - Capsulotomy
  - Nucleus fragmentation

No competition with Phaco

- It does what phacomachine does not
- Technology not effective in the beginning....

- No need of different patient organization
- No need significant patient selection
- Same surgical time

Femto Technology Up to Date
Surgery performed:
on July 3rd 2014 (Right Eye)
on July 4th 2014 (Left Eye)

Preoperative
Right Eye  BCFV 20/25  -8 sph
Left Eye   BCFV 20/25  -8 sph - 1.50 cyl axis 165°

Right Eye  AT LISA tri  +10.00 (July 3rd 2014)
Left Eye   AT LISA tri toric +9.50 +1.50 axis 71 (July 4th 2014)

Postoperative Results:
Right Eye UCFV 20/15 UCFV 20/25 UCFV 20/12
Left Eye   UCFV 20/15 UCFV 20/25 UCFV 20/12

AT LISA® tri toric: Far Vision

Intermediate Vision

Near Vision
Case Presentation

Female 48 y.o.
Bilateral Myopia -5 Dipters plus astigmatism ? (No data available)
Bilateral Radial Keratotomy 1990 (Columbia)
16 Incision plus 1 transversal to correct astigmatism

May 2014
RE BCFV 20/20 +5.50 SF +0.75 CYL AX 35  Plus 1.75 Near Vision
LE BCFV 20/20 +7.50 SF +1.00 CYL AX 50  Plus 1.75 Near Vision

Anterior Chamber Depth:
Right Eye 1.65 mm
Left Eye 1.54 mm

Planned Surgery

Female 48 y.o.
Bilateral Radial Keratotomy 1990 (Columbia)

May 2014

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

Bilateral AT LISA Tri IOLD Implantation (Ziess Meditec)

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Capsulorrhexis

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Nucleus Removal

Results

• Left Eye IOL Implanted + 30.50 AT LISA tri
• Right Eye IOL Implanted + 29.00 AT LISA tri

• 1 Month post Surgery
  • RE BCFV 20/20 +2.00 SF +1.50 CYL AX 10°
  • LE BCFV 20/20 +3.50 SF +2.00 CYL AX 40°

• 3 Months post Surgery
  • RE BCFV 20/20 +2.50 SF +1.00 CYL AX 20°
  • LE BCFV 20/20 +2.50 SF +2.00 CYL AX 40°
Case Presentation 2

Female 56 y.o.

RE CK 1975 CHERATOCONUS
LE OCULAR TRAUMA

April 2014
RE BCFV 63/20 -12.00 CYL AX 60°
LE BCFV 63/20 -7.00 SF -5.00 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 cyļ ax 146°

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
Nucleous Removal

Femto Laser Assisted Cataract Surgery
Catalys AMO Abbott
IOL Implantation
Results

Right Eye AT TORII ICL Implantation +4.00 SF +12.00 cyl ax 165°

1 Month post Surgery
- RE BCPR 45/20-3.00 SF +5.00 CYL AX 150°
- 3 Months post Surgery
- RE BCPR 45/20-2.00 SF +6.00 CYL AX 165°

Left Eye 3 Months PO

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 (Blaze height) Create Different Diffraction Efficiency and Light Loss
- Tonic Multifocal over 0.75 D of Corneal Astigmatism
- Mosaic, Glare and Ghost Images are Difficult to Manage in Susceptible Patients
- Poor Intermediate Distance Vision
- 6.50 Diopter SE generates less of an outline of Visual Acuity
- Perfect Target: Null Postop Refractive Results

Bilateral Tecnis® MIOL
22 eyes of 18 patients
Mean Age: 56.6 ± 8.9

Yag Laser Treatment

52 Patients with ReZoom® + Tecnis® Implantation (104 eyes)
10 Patients with Bilateral Tecnis® Implantation (32 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.


Acr. LISA® Tone
% YAG LASER CAPSULOTOMY - 35 EYES

**EARLY YAG LASER TREATMENTS**
12 Eyes - yag laser treatments (34.2%)

- AntiLISA Tests
  - 0%< 1 Months
  - 8.4% >1 Months

**Synchrony Dual Optics AIOL**
UCVA vs. BCIVA - 33 Eyes

- Monocular defocus curve Synchrony Dual Optics AIOL

**Accommodating IOLs Best**

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

**AT LISA® tri - Trifocal Optic**

- The central zone of the AT LISA® tri provides:
  - a near addition of +3.00 D for a comfortable reading distance
  - an intermediate addition of +1.60 D
- It improves intermediate vision without compromising near or far vision.

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

AT LISA® tri : asymmetrical light distribution:
- 50% far
- 26% intermediate
- 24% near
This technology decreases light loss

<table>
<thead>
<tr>
<th>LIGHT DISTRIBUTION</th>
<th>Outside Range of Vision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near</td>
<td>Intermediate</td>
</tr>
<tr>
<td>50%</td>
<td>20%</td>
</tr>
<tr>
<td>pupil</td>
<td></td>
</tr>
</tbody>
</table>

AT LISA® tri Materials and Methods
- AT LISA® tri implanted in 76 eyes of 46 patients
- Mean Age 64.22 ± 10.22
- Mean Preoperative BCVA 0.77 ± 0.27
- Mean Time Follow Up 734.25 ± 20.16 days
- Mean Preoperative Sphere Equivalent 0.44 ± 2.21

AT LISA® tri (Eicon)
UCVA - BCVA and Sphere Equivalent (76 Eyes)

UCVA

BCVA

AT LISA® tri Near Monocular Vision (EDTRS)

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: 396.20 ± 123.30 days

AT LISA® tri Toric Materials and Methods
- AT LISA® tri toric implanted in 40 eyes of 24 patients
- Mean Age 50.00 ± 14.79
- Mean Preoperative BCVA 0.70 ± 0.20
- Mean Time Follow Up 573.75 ± 15.58 days
- Mean Preoperative Sphere Equivalent 1.15 ± 3.04
- Mean Preoperative Corneal astigmatism 1.36 ± 0.43
- Mean Preoperative Retractive Astigmatism 0.63 ± 0.83
Quality of Vision
Contrast Sensitivity and Control Values

Control values for CS are derived from Hohberger paper
D. Hohberger et al. - Measuring contrast sensitivity in normal subjects with OPTEC 2200
International journal of age and aging research American College of Geriatrics, 2007, 24(2) 180-1814

- 10-14 healthy phakic subjects for the following age groups:
- Functional Image Analyzer OPTEC 6500P
- Daytime (53 cd/m²), Nighttime (3 cd/m²) and Nighttime with Giarus (1 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  - 6 sph
Left Eye   BCFV 20/25  - 8 sph  - 1.50 cyl axis 165°

Right Eye AT LISA tri  + 10.00
Left Eye  AT LISA tri torio + 6.50  + 1.50 axis 71

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

Conclusions:

> Bilateral Diffractive IOL technology is difficult to manage to avoid quality of vision
> Resting Perimetric results in a significant number of patients. Bilateral Diffractive IOL technology
> has no significant loss of light for intermediate distance and an important amount of light
> The Trifocal Diffractive IOL technology overcome the weak point providing specific
> % of light for Intermediate distance and reduces the light loss % improving diffractive
> Efficiency and quality of vision
> Having, Glass and Cibertet images are difficult to manage in demanding instants:
> Trifocal Diffractive IOL technology is an effective tool to reduce night driving
> problems due to non symmetrical % of light extraction
> 5 mm pupil size condition works at the best to minimize patient complaints. Larger
> pupils have to be detected preop. It is really important a proper patient selection
> related to pupil dynamics.
> Perfect Target after Diffractive IOL Technology Implantation is Paint Postop
> needling.
Conclusions

- Due to loss of contrast sensitivity (up to 20%) we provided to our patients a small led high power light to get Jaeger 1 near vision in the light condition.

- After advanced technology cataract surgery patients are not paralyzed by evident differences in their vision but they need practical directions to overcome any possible visual weak points.

Thank you for your attention!
**Case History**
- 59 year old healthy white female
- History increase IOP
- Mother has history of glaucoma
- Presents for refractive surgery
- Contact lens wearer (monovision)

**Pre-op Exam**
- Pre-operative refraction
  - OD -10.00 -1.23 x 90° 20/20
  - OS -12.00 -1.00 x 87° 20/25-
- Central pachymetry
  - OD 540 microns
  - OS 530 microns
- Keratometry
  - OD 42.62/43.12
  - OS 42.23/42.87

**History**
- Patient underwent sequential bilateral uneventful phacoemulsification with simultaneous "in the bag" implantation of a ReStor multifocal IOL.
- Patient c/o glare, halo and decreased visual acuity.
- Seeks second opinion.

**Exam**
- Refraction
  - OD Plano -1.23 x 178° 20/30-
  - OS -0.25 -1.00 x 5° 20/50+
**Recommendation**

- Retinal Referral
- Topical NSAID qid
- Patient tried -3.00 glasses to mimic monofocal IOL
- Advise against IOL exchange but will be willing to consider as long as patient has full informed consent.
**Preliminary Results of Intrastromal Femtosecond Astigmatic Keratotomy**

Steve C. Schallhorn MD

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**Femtosecond Intrastromal AK**

- **Advantages**
  - The accuracy and precision of the femtosecond laser
  - No epithelial injury
  - Quick procedure
  - Fast visual recovery

- **Disadvantages**
  - Requires femtosecond laser/cost
  - Nomogram under development
  - Limit on maximum cylinder correction

---

**Demographics**

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patient (eyes)</td>
<td>105 pts (122 eyes)</td>
</tr>
<tr>
<td>Age</td>
<td>58 yrs range 21 to 78 yrs</td>
</tr>
<tr>
<td>Gender</td>
<td>53% male; 47% female</td>
</tr>
<tr>
<td>Eye treated</td>
<td>46% left; 54% right</td>
</tr>
</tbody>
</table>

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**Monthly Results from Primary Procedure to ISAK**

- 0-1.9 months: 26.9%
- 2.0-2.9 months: 12.7%
- 3.0-3.9 months: 5.5%
- 4.0-4.9 months: 4.7%
- 5.0-5.9 months: 4.7%
- 6.0-6.9 months: 4.7%
- 7.0-7.9 months: 0.0%
- 8.0-8.9 months: 4.7%

---

**ISAK Nomogram**

- Paired symmetric (same length) arcuate incisions centered on the steep axis
- Optical Zone: 7mm
- 80% corneal thickness
- 60 micron from Epithelium

<table>
<thead>
<tr>
<th>Incised Cylinder Correction (D)</th>
<th>Arc length (degrees)</th>
</tr>
</thead>
<tbody>
<tr>
<td>-0.50 to -1.25</td>
<td>40</td>
</tr>
<tr>
<td>-1.50 to -1.75</td>
<td>50</td>
</tr>
<tr>
<td>-2.00 to -5.50</td>
<td>60 to 75</td>
</tr>
</tbody>
</table>

---

**Preop and Postop Refraction**

<table>
<thead>
<tr>
<th></th>
<th>Preoperative</th>
<th>1 month</th>
<th>3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sph (mean(SD))</td>
<td>-40.56 ± 1.19</td>
<td>-40.22 ± 1.12</td>
<td>-40.26 ± 0.68</td>
</tr>
<tr>
<td>Cyl (mean(SD))</td>
<td>-5.00 ± 1.50</td>
<td>-5.00 to -3.50</td>
<td>-5.00 to -3.50</td>
</tr>
<tr>
<td>Min, Max</td>
<td>-5.00 to -3.50</td>
<td>-5.00 to -3.50</td>
<td>-5.00 to -3.50</td>
</tr>
<tr>
<td>MVE (mean(SD))</td>
<td>-0.65 ± 0.43</td>
<td>-0.67 ± 0.19</td>
<td>-0.67 ± 0.19</td>
</tr>
<tr>
<td>Min, Max</td>
<td>-0.68 to +0.68</td>
<td>-0.68 to +0.68</td>
<td>-0.68 to +0.68</td>
</tr>
<tr>
<td>Iso (mean(SD))</td>
<td>-1.50 ± 1.00</td>
<td>-1.50 to -0.50</td>
<td>-1.50 to -0.50</td>
</tr>
<tr>
<td>Min, Max</td>
<td>-1.50 to 0.00</td>
<td>-1.50 to +0.50</td>
<td>-1.50 to +0.50</td>
</tr>
</tbody>
</table>
Stability of Cylinder
Consecutive Cohort (n=41)

3M Change in Corrected Distance Visual Acuity

Preop and 3M UCVA

Conclusions

- Initial results of intra-stromal femtosecond AK show that it can safely reduce moderate levels of astigmatism
  - Can be titrated but significant variability
- No change in MSE
- CR 0.78 indicates under-correction
- Appears stable
  - 1 week to 3 month followup
- Nomogram refinement underway
“Option for Secondary Posterior Chamber IOLs: Scleral Tunnel with Glue”
Roger F. Steinert MD

**Options for Secondary Posterior Chamber IOLs: Scleral Tunnel with Glue**

Relevant Disclosures: None

**Roger F. Steinert, MD**
Irving L. Leopold Professor and Chair
Professor of Biomedical Engineering
Director, Gavin Herbert Eye Institute
University of California, Irvine

---

**Scleral Tunnel and Glue Haptic Fixation**
- Innovated and popularized by Amar Agarwal, MD

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**Why This Technique?**
- Late suture breakage of sutured PC IOLs
- Key breakthroughs to my acceptance of this technique:
  - See Amar Agarwal perform live surgery
  - Hear other surgeons *not* report late complications
  - Realize it is the tunnel, not the glue, that is responsible for long-term stability

---

**WARNING: This is not easy!**

However, the results have the potential of better long-term stability and therefore is worth the effort

---

**My Preferred IOLs**
- Staar AQ 2010V
  - 13.5 mm haptic diameter
  - 6.3 mm silicone optic
  - Polyimide (Supramid) haptic
    - Tough
    - No kinking of haptics!
- AcrySof EC-3 PAL
  - Acrylic optic; PolyVinylidene Fluoride haptics

---

**Key Steps**
- Carefully mark 180 degrees and dissect centered on those marks
Key Steps

- Carefully mark 100 degrees
- Use gentian violet to mark the tunnel when created with 21 g needle

Key Steps

- Carefully mark 100 degrees
- Use gentian violet to mark the tunnel
- Insert AC maintainer
- MVR 21g puncture 1 mm posterior to limbus; use coaxial action micro-forceps
- Secure first haptic with Mackool hook retention "slider" or have a good surgical assistant!!

Key Steps

- Carefully mark 100 degrees
- Use gentian violet to mark the tunnel
- Insert AC maintainer
- MVR 21g puncture 1 mm posterior to limbus; use coaxial action micro-forceps
- Secure first haptic with Mackool hook retention "slider" or have a good surgical assistant!!
- Deliver second haptic with 2 instruments (Agarwal's "handshake" maneuver)
Key Steps
- Carefully mark 180 degrees
- Use gentian violet to mark the tunnel
- Insert AC maintainer
- MVR 21g puncture 1 mm posterior to limbus, use coaxial action micro-forceps
- Secure first haptic with Mackool hook retention "slider" or have a good surgical assistant!!
- Deliver second haptic with 2 Instruments (Agarwal’s "handshake" maneuver)
- Insert each haptic into tunnel

Glue flap and conjunctiva

Summary
- Scleral tunnel fixation solves long-term suture degradation issue
- Tissue glue seals the sclerотomies and provides short-term stability
- The scleral compression of the haptic creates permanent stability
- Scleral tunnel fixation is worth the effort!
Thank You!!
“The Promise of No Glasses or Contact Lenses!”
Jack T. Holladay MD, MSEE, FACS

Financial Disclosure
- I have the following financial interests or relationships to disclose:
  - Abbott Medical Optics: C
  - Alcon: C, O
  - Allergan: C, O
  - Allergan: C, O
  - Carl Zeiss Meditec: C
  - Essilor: C, O
  - Otsuka: C, O
  - Visionol: C, O
  - WaveLight: C

Requirements
- Centration
- Accurate Biometry – Optical (IOL Master or LenStar)
- Accurate K’s - Repeatable
- 4th Generation Formula (WTW)
- Personalized Lens Constant
- Eliminate Corneal Astigmatism

Multifocal IOL
Optimal Location
- Cannot place on Pupil Center & Visual Axis (near P1) where axial ray is perpendicular to foveola.
- Optimal location is different for each patient and somewhere between Pupil Center & P1.
**IOL Power Calculations**

- Pentacam can measure FRONT & BACK SURFACE POWER
- Can Calculate:
  - Equivalent K-Reading (EKR)
  - 65% Mean, Peak & Average
  - NET POWER

**EKR**

- Reports Keratometry value but adjusts for Back Surface Power from Normal (Current IOL Formulas)
- If corneal front surface is 7.5 mm (45 D), but if back surface -0.3 D > normal:
  \[
  \text{EKR} = 45.0 - 0.3 = 44.7 \text{ D}
  \]
- Note: Net Power = 43.3 D

**New algorithm for intraocular lens power calculations after myopic laser in situ keratomileusis based on rotating Scheimpflug camera data**

**IOL Calcs – Abnormal Cornea**

- Post Refractive Surgery
- Post PKP
- Keratoconus
- Corneal Scar
- Any Irregular Astigmatism
Use 65% Mean EKR
(@ 4.5, 4 & 3 mm zones)

Normal
LASIK
RK

41 to 44 D
3 D Range
36 to 41 D
5 D Range
32 to 45 D
13 D Range

POST LASIK

Post LASIK CALC

- \( K_{\text{mean}} = 39.8 \text{ D} \)
- Used 39.8 D => SEQ = +1.12 D
  \[ (+1.00 + 0.25 \times 155 = 20/20) \]
- 65% mean = 38.8 D => +0.12 D
- Use 65% mean K

Conclusions

- EKR – Use 65% Mean for all IOL Calcs
- Look @ smaller zones than 4.5 mm if pupil very small
  (< 3.0 mm in dim light)

Requirements

- Accurate Biometry – IOL Master
- Accurate K’s– Repeatable
- 4th Generation Formula (WTW)
- Personalized Lens Constant
- Eliminate Corneal Astigmatism
Vergence Formula

\[
IOL = \frac{1336}{AL-ELP} - \frac{1336}{1000} + K(\text{Post R}) - \frac{ELP}{1000} - \frac{V}{DPostRx}
\]

CONCLUSION: 9 EYES

<table>
<thead>
<tr>
<th>Anterior Segment Size</th>
<th>Megacornea</th>
<th>Megacornea</th>
<th>Large Eye</th>
<th>Large Eye</th>
<th>Macular Degeneration</th>
<th>Macular Degeneration</th>
<th>Macular Degeneration</th>
<th>Long</th>
<th>Normal</th>
<th>Normal</th>
<th>Normal</th>
<th>Short</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>+ astigmatism</td>
<td>(6%)</td>
<td>(2%)</td>
<td>(20%)</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>+ astigmatism</td>
<td>(6%)</td>
<td>(10%)</td>
<td>(6%)</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small</td>
<td>+ narrow</td>
<td>(20%)</td>
<td>(2%)</td>
<td>(0%)</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td>Macular Degeneration</td>
<td></td>
<td></td>
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</tbody>
</table>

Measurements taken for Predictors of ELP
- Axial Length
- Average K (Pre Ref)
- Horizontal WTW
- ACD
- LT
- Pre-op Refraction
- Age

FORMULA PERFORMANCE

Mean Absolute Error (D)

\[
N = 997
\]

Requirements
- Accurate Biometry – IOL Master
- Accurate K’s- Repeatable
- 4th Generation Formula (WTW)
- Personalized Lens Constant
- Eliminate Corneal Astigmatism
**Personalized Lens Constant**
- Never use Manufacturer’s Constant except to start
- 20 to 40 cases and continue
- Factors
  - IOL Style
  - Lens placement
  - Post op medications
  - Biometer, keratometer, ...

**Requirements**
- Accurate Biometry – IOL Master
- Accurate K’s- Repeatable
- 4th Generation Formula (WTW)
- Personalized Lens Constant
- Eliminate Corneal Astigmatism

**TORIC IOL Calculations**
- Commercial Calculators use a constant ratio (1.46) for the corneal cylinder to the IOL cylinder
- Exact Calculation depends on IOL SEQ Power and ELP ... to correct 2D of corneal astigmatism
  - 10 D IOL => 15.5 D Cylinder
  - 22 D IOL => 29 D Cylinder
  - 34 D IOL => 24.4 D Cylinder
- A 1.1 D difference from 10 D to 34 D!

**Toric Optimization**

![Graph and diagrams related to toric optimization.](image)
“Integration: Office to OR”
Donald Serafano MD

INTEGRATION: OFFICE TO OR

Donald Serafano MD
Private Practice
Long Beach CA

Financial Disclosure

- Consultant Alcon Surgical
- No financial interest in products presented

What is meant by integration?

- Integration is the coordination of individual components.
- Currently in cataract surgery this applies to coordinating individual instruments or groups of instruments to achieve a successful outcome

INDIVIDUAL INSTRUMENTS CURRENTLY USED IN CATARACT SURGERY

- Biometry: A Scan and Immersion devices
- Formulae used to calculate IOL power
- Astigmatism: Web sites such as ACSRS, corporate
- Imaging: Topographers, Corneal Shape Analyzers
- Femtosecond lasers
- Axis markers
- Toric IOLs
- LRI blades and laser
- Intraoperative aberometry

Cataract Procedure:

Pre-Op (Current x Future)

BEYOND

Cataract Procedure:

IOL Planning (Current x Future)

BEYOND
Cataract Procedure:
Data transfer (Current & Future)

3 CURRENT INTEGRATION SYSTEMS AVAILABLE IN USA
- Zeiss in association with AMO: Zeiss Cataract Suite Markerless
- Alcon: Cataract Surgical Suite with Verion
- i-Optics, LENSAR, TrueVision

Targeting Error Sources in the Current Process
Integration has the potential to reduce post-operative residual refraction error at multiple steps of the cataract surgery process:
- Biometry
- Transmission
- Antiglaucoma
- Manual marking
- Optimization
- Inflation
- Capsulorhexis
- IC positioning

Products designed to work together for markerless toric IOL alignment

ZEISS Cataract Suite markerless
Eliminates manual eye marking and allows for seamless data transfer

IOLMaster™ 500 — Precision IOL power calculations and plaque tracing with excellent biometry and capturing of reference image of the eye
Introducing the VERION® Image Guided System

- Designed to help you consistently achieve your refractive target

The VERION® Image Guided System is designed to add greater accuracy and efficiency during surgical planning and execution.

VERION® Reference Unit

- **Image**
  - With a convenient desktop interface, the VERION® Reference Unit:
    - Measures keratometry, pupilometry and other key pre-op parameters
    - Captures a high-resolution, diagnostic reference image of the patient’s eye
    - Auto-detects scleral vessels, limbus, pupil and iris features

- **Plan**
  - The VERION® Reference Unit also enables surgeons to quickly and efficiently determine an optimized surgical plan:
    - Multiple advanced formula IOL calculations, including lens and power selection
    - Implantation and implantation site planning customized for each patient
Comprehensive Astigmatism Planner

Image and Plan Video

VERION Digital Marker
- The VERION Digital Marker can be used with the LenSx Laser as well as most surgical microscopes.

LenSx Laser Dock

VERION Digital Marker
- Registration at the Scope (after LenSx)

TRUE VISON/ CASSINI/LENSAR
- Cassini Corneal Shape Analyzer to determine axis and magnitude of astigmatism
- Cassini IR imaging data transfer to LENSAR Iris registration
- True Plan Image with True Guide
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