Premium IOL’s Patient Evaluation, Lens Choice and Dealing with Problems

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Financial Interest Disclosure

- Douglas K. Devries
- Consultant or Speakers Bureau for
  - Allergan
  - Alcon
  - Akorn
  - Bausch Health Care
  - Bausch
  - BioTissue
  - Bruder
  - EyeVance
  - Eye-K-Lens
  - Eye
  - Johnson & Johnson Vision/Acuvue
  - Lumenis
  - OcuSoft
  - Oyster Point
  - Phagex
  - Retina
  - Science Based Health
  - Sol Pharmaceuticals

Course Goals

- Discuss Peri-Operative Management of Cataract Surgery
- Patient Education of Dysfunctional Lens Syndrome
- IOL Choices & Presbyopia Correction Options
  - Multi-Focal
  - Extended Depth of Focus (EDOF)
  - Patient Choices & Toric IOLS

Why Co-Manage?

- Discussion:
  - First and Foremost: Patient Care
  - Patient Education
  - Patient Retention
  - Financial Impact

Demographics

Growth of Cataract Surgery Patients

- Significant growth of the 65+ yo population
Treatment Astigmatism & Presbyopia in Cataract Surgery

1/3 of Patients have > 1.0D of astigmatism but only 1/4 of those patients are receiving a Toric IOL.

<table>
<thead>
<tr>
<th>% of Patients receiving Toric IOL</th>
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<td>- Patients &gt; 1.0D Astigmatism</td>
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<td>- Patients receiving Toric IOL</td>
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Every patient over the age of 50 is impacted by presbyopia, yet only 6.5% of patients receive a presbyopia-correcting IOL.

67% 8% 25% 33%

% of Patients receiving Toric IOL

■ Patients > 1.0D Astigmatism
■ Patients receiving Toric IOL
■ PC IOL
■ Monofocal IOL

Who Sees Cataract Patients First?

58,000 eye care professionals are licensed to perform comprehensive eye exams.

<table>
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<tr>
<th>Optometrists</th>
<th>Ophthalmologists</th>
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<td>18,000 (32%)</td>
<td>40,000 (68%)</td>
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ODs perform an estimated 88 million comprehensive eye exams annually of the total of 104 million performed by all eye care professionals, or 85 percent of all comprehensive eye exams.

The Dysfunctional Lens

- The crystalline lens begins...
  - CLEAR
  - COLORLESS
  - FLEXIBLE

Dysfunctional Lens Syndrome (DLS)

- ... but it doesn’t stay that way.
- Lens adds new layers each year
- Layers compact
- Disulfide bonds accumulate
- Lens stiffens
- Lens optics change

The Dysfunctional Lens

23 year old lens 48 year old lens 55 year old lens

Stage 1 DLS Stage 2 DLS

Dysfunctional Lens Syndrome (DLS)

Stage 1 (mid 40’s – early 50’s)

- Lens stiffens and cannot change shape as easily
- Loss of accommodation
Dysfunctional Lens Syndrome (DLS)

**Stage 2** (50’s-60’s)
- Increasing lens haze
- Yellow discoloration
- Scatter of light
- Decreased quality of vision

**Stage 3** (60’s – 80’s)
- Cataract: a clouding of the lens of the eye that obstructs the passage of light

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**Dysfunctional Lens Syndrome (DLS) Stage 1**

- Reading glasses or multifocal contact lenses
- Corneal inlays
- Blended Vision LASIK or PRK
- RLE for High Hyperopes

**Dysfunctional Lens Syndrome (DLS) Stage 2**

- Reading glasses or multifocal contact lenses
- Corneal inlays
- Blended Vision LASIK or PRK with extra DLS education
- RLE

**Dysfunctional Lens Syndrome (DLS) Stage 3**

- Cataract Surgery
  - Monofocal IOL
  - Distance only
  - Monovision
- Presbyopia Correcting IOL

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**Understand your Patient: Expectations for Presbyopia**

What they say:
- “I want to be able to read”

What they want:
- Accommodation
Discussion

Why is it important to prepare the ocular surface before surgery?

Our Role in Optimizing Outcomes

When needed, pre-treat the ocular surface

Why prepare the ocular surface?
- Better topography images/Improved Biometry (better K’s)
- More comfortable patient
- Faster healing
- Outcomes
- Accurate biometry drives better outcomes

Dry Eye Prevalence in Patients Scheduled for Cataract Surgery

- 22.1% of patients had previously received a diagnosis of Dry Eye Disease
- 80.9% of patients had an ITF Dry Eye Level 2 or higher, based on the presence of signs and symptoms
  * An ITF level of 2 indicates moderate Dry Eye.

Panel Discussion

When do you treat dry eye?

“Hot Spots” and “Flat Spots” Are Abnormal

Irregularly Shaped Or Smudgy Placido Disk Is Abnormal
Take A Closer Look If Average K Values Are Different

Post-Dry Eye Treatment: K Values Are Much More Similar

Recommendations to Manage OSD-Related Patient Expectations
- Chair time to help patients understand difference between blurred vision from cataracts versus DED
- Cataract surgery can worsen DED for months after surgery
- Symptoms may not resolve for 3 months or longer

Ocular Surface Testing
- Questionnaire
- Osmolarity
- Inflammation
- Meibography
- NaFl Staining and TBUT
- Meibomian Gland Evaluation

Standard Patient Evaluation of Eye Dryness (SPEED) Questionnaire
- Evaluates the frequency and severity of symptoms
- Developed as an easy to use fast screening tool for dry eye disease
- SPEED questionnaire is one of the tools used to identify candidates for LipiFlow

Why Address MGD Pre-op?
- No Significant Structural Change
- Duct Dilation, Truncation & Drop Out
- Severe Truncation & Drop Out
Discussion

How often do you find gland involvement in patients with ocular surface disease?

MGD is a Leading Cause of Dry Eye

In one study, 48% of patients diagnosed with Dry Eye have symptoms related to or originating from compromised Meibomian gland function.


86% MGD (n=79)

50% MGD and aqueous-deficient (n=57)

36% Aqueous-deficient (n=23)

14%
Turn up the Heat on Dry Eye Treatment

Heat it
Apply LED light to raise the eyelid temperature and melt the blockages.

New! Ophthalmic Surgical Instruments

Collins Expressor Forceps (Item 98610)
For aggressive expression of the Meibomian gland.

Livengood Expressor Paddles
Angled (Item 98620) & Flat (Item 98630)
For mild or gentle expression of the Meibomian gland.

Consider Dry Eye

Dry Eye is a Frequent Cause for Dissatisfaction with MF IOLs

Question
• Do you make specific IOL recommendations that a patient should discuss with the surgeon?
  • A Yes
  • B No

Patient Counseling & Expectation Management: Incorporate Patient Into the Decision

• Advise patients about potential glare/halos

• Advise patients about light dependency for near (some multifocals)

• Advise patients of limitations in intermediate vision, (multifocals) or near vision (accommodating)

• Advise patient that one eye will be stronger for distance and one stronger for near, if mono
What Do You Know About Your Patient that is Beneficial to the Surgeon?

- Collect important patient information that will help define their vision goals
  - Age
  - Occupational Activities
  - Leisure Activities
  - Nighttime Activities
  - Spectacle Use Expectations
  - Night Driving
  - Obsessive/perfectionists
  - Demanding
  - Anxious
  - Unrealistic

Question

- Do you educate patients as to IOL selections?
  - A Yes in general terms
  - B Yes in specific terms as to their needs
  - C No

Multifocality 2014 & prior...

- Patients wanted to see at ALL distances (near, intermediate, & distance vision)
- What were options for intermediate?

Do not underestimate the importance of good intermediate vision

Many Evolving Surgical Presbyopia Correcting Options

- Monofocal IOL Monovision
- Mini-monovision with presbyopia IOLs
- Mixing and matching presbyopia IOLs
- Low add IOLs
- EDOF IOLs

Monofocal Monovision IOLs

Pros
- Cost-effective
- Monofocal quality of vision
- Less sensitivity to IOL decentration

Cons
- Reduced depth perception
- Feeling of imbalance
- Limited intermediate vision
- Need for spectacles driving and post

Ideal patient candidates:
- Contact lens trial
- Patients with experience of monovision contact lenses
- Type B patients
- Patients who do not mind wearing glasses
- Women
Low add Multifocal IOLs

- Pros:
  - Good distance visual acuity
  - Good near vision
  - Limits spectacle dependence

- Cons:
  - Glare and halos (but still better than other options)
  - Intermediate VA
  - Neuroadaptation

Ideal patient candidates:
- Avid readers
- Patients that want as much spectacle independence as possible

Extended Depth of Focus (EDOF) IOLs

What's unique about EDOF IOLs?
1. Visual quality comparable to monofocal
2. Depth of focus
3. Night vision symptoms
4. Tolerance to residual refractive error

Extended Depth of Focus (EDOF) IOLs

Symphony
- Unique diffractive echelette design
  - Elongated focus
  - Extended range of vision
- Achromatic for enhanced contrast sensitivity
- Toric EDOF corrects astigmatism

Diffractive Technology
- Diffractive technology has been associated with multifocal IOLs, but it can be used in different ways
- Other industries use diffractive lenses (cameras, telescopes, microscopes) to optimize optical performance under constrained conditions

What is Chromatic Aberration?
- The power of the eye is wavelength dependent. Colors that are out-of-focus cause blur and reduce contrast.
- The phakic eye has approximately 1.38 D of chromatic aberration between 450 and 700 nm.
- Pseudophakic eyes have between 1.45 and 2.0 D of chromatic aberration, depending on the dispersion of the IOL material.
The impact of chromatic aberration on image quality

A diffractive IOL with achromatic technology can correct chromatic aberration of the eye

Extended Depth of Focus (EDOF) IOLs
Spectacle Wear

What’s Happening at Post-op DAY 1

• Review medications
  • IOP Check—concern if too high or too low
  • Check distance vision
  • Wound secure
  • Cornea clear/Edema
  • AC – 1-2 cells / formed
  • IOL centered
  • Provide patient instruction:
    • Review restrictions – no swimming, no hot tubs, no gardening
    • Avoid buyers’ remorse
    • Fax results to surgeon

What’s Happening at Post-op WEEK 1

• Review history/chief complaints and confirm meds
• Check uncorrected vision at distance and near w/ good lighting
• Refract
• IOP
• Slit lamp exam should be clear to < grade 2 cell
• Check for infection or increased signs of inflammation
• Fax results to surgeon

What’s Happening at Post-op MONTH 1

• How is the patient functioning?
• Check uncorrected vision at distance and near with good lighting
• What is the final refraction
• Check IOP
• Slit lamp exam
  — Clear cornea/edema
  — Look for surface disease
  — AC well formed with no cell
  — IOL well centered in pupil
  — Evaluate posterior capsule
• Fundus exam
  — Confirm that there is no CME
  — Check peripheral retina
• Fax results to the surgeon
Extended Depth of Focus (EDOF) IOLs
Managing Expectations

Neuroadaptation Reminder

• REMIND patients that it is important to give the lens a little time to settle in
• Neuroadaptation time varies from patient to patient

If a patient believed he would be able to see perfectly at all distances, we failed to do our job of setting appropriate expectations... no matter how stellar the outcomes

The Dissatisfied Patient

• Subjective complaints
• Vision quality
• Unmatched expectations
• Objective signs
• Real or perceived?
• Evaluate your data

5 C’s
Cornea
Centration
Capsule
CME
Crazy

Consider Dry Eye

Dry Eye is a Frequent Cause for Dissatisfaction with MF IOLs

Astigmatism: Real Prevalence

• >70% of patients have >0.5 D of pre-op astigmatism

• Critical to address for good uncorrected vision

Methods to Treat Astigmatism

• LRI or Arcuate Incision
• Toric IOL
• Glasses or CLs
• No special astigmatism correction needed

Astigmatism and Cataract Surgery

More than 1/3 of the population has >1 D of keratoconus, but only 7% of IOLs implanted are toric IOLs.

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Astigmatism and Cataract Surgery

More than 1/3 of the population has >1 D of keratoconus, but only 7% of IOLs implanted are toric IOLs.
Regular vs irregular astigmatism
- Regular astigmatism
  - Generally good candidates for Toric IOLs
- Irregular astigmatism
  - Often more difficult cases to address with Toric IOLs

WTR vs ATR Astigmatism
- With the rule astigmatism
  - Many patients can tolerate 1.0D or even 1.25D without significant impact on patient satisfaction and visual quality
- Against the rule/oblique astigmatism
  - Generally has a greater impact on patient satisfaction and visual quality
  - Most patients will benefit from having these levels below 0.5 D

Case Ask the Audience: Toric or No toric?
- Corneal topography shows 1.75D of corneal astigmatism
- Manifest refraction shows 0.25D of overall astigmatism

Lenticular vs. Corneal Astigmatism
- Corneal Astigmatism
  - Will continue to impact visual system after cataract surgery
- Lenticular Astigmatism
  - Will **not** continue to impact visual system after cataract surgery
  - However, needs to be understood preoperatively to assess the true corneal astigmatism levels

Lenticular Astigmatism

DISCUSSION
- How would you recommend treating an otherwise healthy cataract surgery patient with 0.75D of *with the rule* cylinder and an interest in less spectacle wear for distance?
DISCUSSION

• How would you recommend treating an otherwise healthy cataract surgery patient with 0.75D of **against the rule** cylinder and an interest in less spectacle wear for distance?

Importance of Hitting Target with Toric IOLs

• 1° rotation = 3.3% decrease effect
• 10° rotation = 33% loss of effect
• 30° rotation = 100% loss of effect
• >30° degrees = Inducing new astigmatism

Astigmatism Correction

• Options at time of Cataract Surgery
  • Monofocal IOL with incisional correction
    • On-axis incision
    • Corneal Relaxing Incisions – Blade vs. Femtosecond
  • Toric IOLs
    • Monofocal
    • Multifocal / EDOF

Monofocal Toric IOL Options

• Alcon (SNATX)
• AMO (ZCT Tecnis monofocal)
• Bausch & Lomb (EnVista Toric)
• Staar Surgical (Silicone Plate Haptic)

Patient Selection for Toric IOLs

• Patient Selection
  • Desires good uncorrected distance vision without spectacles
  • Comfortable with spectacles for near
  • Absence of significant or unstable corneal disease affecting the ocular surface or shape
  • Astigmatism indications
    • WTR – Doesn’t need to be treated until up to 1.00D or even 1.25 D
    • ATR/oblique – Will benefit from getting astig below 0.5 D

Discussion

What value does the optometrist provide to the surgeon?
The Four Stages of Pre-Operative Care
• Knows the patient’s needs and wants
• Gather clinical information
• Offer education on clinically appropriate options
• Pre-treat if indicated

What Do You Know About Your Patient that is Beneficial to the Surgeon?
• Collect important patient information that will help define their vision goals
  • Age
  • Occupational Activities
  • Leisure Activities
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Prepare the Patient for the Busy Surgical Environment
• Review treatment options based on the patient’s situation
• Do not make assumptions about financial situation
• Explain the possibility of visual complications with each option
• Address any questions the patient or family members may have

Co-management relationship
• Ensure that there is a documented relationship established to co-manage any patient with a surgeon
  • Your surgeon should be able to provide you with the documentation

PART II: Clinical Cases:
Post-Op Surprises

Patient #1
• 84 year old female
• Extremely anxious about surgery
• Desires UCVA
• MRX OD: +1.75 +0.75 x 015 (20/40)
• W OD: +1.00 +0.75 x 006
Topographies

~1.40 D aligned around 40°

~2.25 to 2.50 D
aligned 28° to 34°

Barrett Toric Calculation

Implanted SN6ATS 21.0 @ 29°

Patient #1

- POM1: right eye
- UCDVA 20/30
- MRx: -0.50 +0.75 x 35 → 20/20 easy

UNDERCORRECTED within SIMILAR axis
Plan: single 35° manual LRI at 035 degrees

Patient #1

POW 1 s/p LRI: 20/20 -1 and HAPPY
Separate video example:
Single 40° @ 172 degrees

Patient #2

- 76 yo AAM, desires UCDVA
- MRx:
  - OD: -1.50 +1.50 x170 (20/30)
  - OS: -0.75 +1.50 x175 (20/40)
- 2-3+ NSC ou
- ERM OS, OD normal

Patient #2

- OS first: POW 1 20/25 (-0.25 +0.25 x 165)
- OD: Implanted T4 19.0 @ 175 degrees
- POM 1 OD:
  - UCDVA 20/60+
  - MRx: -0.75 + 1.50 x 150

Patient #2

- Toric IOL aligned at 033 degrees
- Options:
  - AKs
  - LASIK/PRK
  - Rotate the IOL
  - IOL exchange
Patient #3

- 61 yo WF
- OD: 3.53 D @ 085
- AL 24.46
- -5.00 +3.50 x090

Patient #3

- Implanted T7 (~3.00D)
- POM 1: -0.75 + 1.50 x 045
- Huh????
- Those with greater WTR anterior corneal astigmatism will have great amounts of posterior WTR astigmatism, but amount is uncertain

Patient #3

- Correctly aligned at 090 degrees
- Overcorrected or undercorrected?
- Options?
  - AK’s
  - IOL exchange
  - LASEK/PRK
  - Rotate the IOL
CLINICAL PEARL

• If the post-op refractive axis changes significantly (oblique to 90 degrees away) and the IOL is aligned correctly, more than likely an OVERCORRECTION has occurred
  • Options:
    • LRI, LVC or IOL reposition to weaken effect of toric IOL

CASE 4

• 71 yo WM
  • PMHx: ALS, wheelchair bound, cognition fully intact, desires spectacle independence
  • MRx:
    • OD +0.25 +0.75 x 010 (20/30)
    • OS +0.50 +1.25 x 180 (20/40)

CASE 4

• Plan: single 45 degree FLAC at 010 degrees
  • POW 1:
    • UCDVA: 20/80
    • MRx: OS -0.75 + 1.50 x 150 (20/30+2)
CASE 4: POW 2 topography

Sim K’s: 1.23 D @ 150°

CASE 4: POW 2 topography

Patient: Management Options

- Pooling within 45 degree AK causing ~1.75D flattening effect ➔ slight gaping
- Changed meridian
  - Patient c/o slight fluctuations in vision
  - No discomfort
- How to proceed?

CASE 4: POW 7 s/p BCL:
UNCHANGED FOCAL GAPING

Sim K’s: 1.49 D @ 149°

What would you do for this patient?

CASE 4

- At POM 2.5 ➔ proceeded with IOL exchange for a T4 IOL, aligned at 150
- POW 1 OS ➔
  - UCVA 20/25
  - OS -0.25 + 0.25 x 085
Thank You

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