The Future of Cataract Surgery
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Cope CE Outline

Disclosures

• Center Director, Omni Eye Services of Atlanta
• Chairman, SECO International CE Committee
• No industry relationships to disclose

Finally some recognition that co-management is “ok”!
Basic Principles of Co-Managed Care

- Make sure patient knows of any co-management arrangement and agrees to it willingly
- Surgeon must have a form that patient signs indicating patient’s willingness to have post-op care provided by OD
- Other than this, nothing should be in writing; there should be NO CONTRACT between practices

Basic Principles of Comanaged Care

- Make sure that you document your charts carefully
- Be ready to justify the extra work you do when you receive a comanagement fee from the surgeon for anything...lasik, premium lenses, etc.
  * Topography, OCT, pachymetry, slit lamp photos

History

- Procedure, Eye, Date, Surgeon
  * S/P Pterygium resection OD x 1 day (Status-post)
  * S/P Trabeculectomy with MMC. POD # 1

History

- Subjective complaints
  * Foreign body sensation
  * Pain, discomfort, sleep
  * Nausea, vomiting
  * Visual status/improvement
  * Photopsias, other visual sensations
History

• Post-operative medications/instructions
• Earliest opportunity to assess compliance
• Ask to see bottles and to bring to future visits

Visual Acuity

• Assess best corrected visual acuity
• Critical to early identification of problems
• Must always be able to explain change or unexpected visual acuity loss

External Exam

- Specific to procedure performed
- Be sensitive to peri-orbital pain and photophobia
- Remove any patches/shields
- Gently clean peri-orbital skin with attention to lid and lashes (tape adhesives, dried mucous, clotted blood)

S/L Exam

- Specific to procedure
- Don’t miss cell and flare
IOP: don’t be afraid to do Goldmann!

Fundus Examination

- At the very least a red reflex should be noted
- If unexpected or otherwise unexplained decrease in VA...you must dilate and explain

Basic to all CoManagement

- Two way communication
- You must communicate your findings to surgeon
- You must expect that surgeon will communicate with you regarding what went on in surgery

The most important factor that determines if a patient is ready for cataract surgery in the eyes of CMS is:

A. Visual acuity
B. Glare testing
C. Lifestyle complaint
D. Density of cataract
Component 1:  
**History**

- **Eye:** functional history such as “problems with glare/TV/driving at night”
- **Activities of Daily Living:** MUST BE DOCUMENTED!
- **Social History:** chronic depression, bipolar, anxiety disorders
- **Observation during exam:** ambivalence, excessive questioning, unrealistic expectations, wanting guarantees

Component 2:  
**Vision and Refraction**

- **Visual Acuity (D & N)**
- **Pinhole should be part of vision**
  - Monocular diplopia or glare alleviated?
- **Glare testing or BAT (medium setting), or “Ambient Light” (room lights on)**
  for any patient who is 20/40 or better

Component 3:  
**Ocular Health**

- **Slit Lamp**
- **Dilated Fundus Exam**

Past Eye and Medical History Critical

- **Medications:** Flomax?
- **Contact Lens Wearer or Refractive Surgery Hx?**
- **Trauma/PEX/COAG**
- **Diabetes/Hypertension**
  - How long have you had it
  - What do you take for it
  - Is it under control/when last checked/A1C
  - Doctor’s name
When in doubt about the retina, get an OCT... especially with premium lenses!

Clean Up Crew

- Lid scrubs
- Azasite
- Dry eye and mgd management

Time to Write Down Your Impression and Plan

- **Impression:**
  - "Cataracts OD > OS with difficulty reading OU
  - 2+ NS consistent with reduced VA
  - Would like to rely less on glasses

- **Plan:**
  - Schedule bilateral Restor IOL's OD then OS
  - Premium IOL discussed, patient not interested/Schedule conventional monofocal IOL OD then OS

Or ...........

- **Impression:**
  - "Cataracts OU, night driving problems
  - 3+ NS consistent with reduced VA
  - 2 diopters of cylinder

- **Plan:**
  - IOL's OD then OS
  - Patient denies Toric due to $, told unaided VA won't be 20/20
Communication Key!

- Detailed referral note with
- Refractive Goal
  - Meds (Flomax) and Conditions
  - Glaucoma, Ocular Surface Disease
- Visit the surgeon so you know what patients will experience

Cassini Corneal Shape Analyzer
As far as the IOL is concerned...

- The “old days” of sending the patient on to your surgeon and not thinking about the refractive result are over
- You know more about their refractive history than anyone else, so be involved and stay involved

The Choices in High Technology or “Premium” Lenses 2016

- Multifocal /
- Accommodating IOLs
- Toric IOLs

Custom Cataract Surgery w/ Advanced Technology IOL’s
What’s New and What’s Coming?
ReSTOR +2.5: Who is this lens for?

The ReSTOR® +2.5 Patient
• Patient w/ active lifestyle that wants good interm. and dist. Va
• Not willing to compromise distance for a full range
• Desires more opportunity for a range of vision vs monofocal
• Desires spectacle independence at 21 inches and beyond
• May need +1.00 reader for 16-20 inches

Optic Design Differences: ReSTOR® +2.5 vs. ReSTOR® +3.0
7 rings vs 9 rings

Reduced the add power from 3.0D to 2.5D by:
• Reducing diffractive rings from 9 to 7 and increasing spacing
Altered the light distribution by:
• Increasing the distance energy of the center zone from 40% to 100%
• Reducing apodized diffractive area by 18%
• Increasing the outer distance area by 6%

RESTOR TORIC
• FDA “approved” for Fall 2015 release but delayed again until sometime this year!
• 1st multifocal toric
• +3.0 add
• 1D-2.5D corneal astigmatism

Bausch & Lomb Trulign Toric
• Only accommodative toric IOL approved in U.S.
• Good distance/intermediate
• Refractive surprises post-op
Tecnis Multifocal in +2.75/3.25
AND
Tecnis Toric

• Corneal astigmatism
  1. ZCT150- 1.03D
  2. ZCT225- 1.54D
  3. ZCT300- 2.06D
  4. ZCT400- 2.74D

Acrysof Toric- Extended Power Range

• SN6AT3- 1.03D corneal plane
• SN6AT4- 1.55D
• SN6AT5- 2.06D
• SN6AT6- 2.57D
• SN6AT7- 3.08D
• SN6AT8- 3.60D
• SN6AT9- 4.11D

Who Should You Discuss Premium Lenses with?

A. Patients with 6 figure income
B. Those who want a perfect result
C. Night drivers
D. Every patient

“Selling” the lens

• You may not believe in it, but you had better offer it...assuming your surgeon does!
• Ask patient about their goals and go from there
• Be upbeat, but don’t overpromise
Extra work: yes, but you should be paid for your time

• Document extra tests
• Work with a surgeon who co-manages premium IOLs

Counseling IOL Patients

• Critical to be part of the education process if you want to be the “expert” in the eyes of your patients
• “He never told me I had astigmatism or that there was a lens to correct it” makes you look BAD
• Also send patients to where you believe they will get best care— not closest, but best. They are coming to you for YOUR advice, not “here’s a list, pick 1”

Malpractice?

• “Will I be at risk if I tell the patient about the lens and they end up not doing well”
• ODs are at a higher risk from “failure to inform” suits than from misdiagnosis suits
Using the Right Terminology

- Premium lens
- Lifestyle lens
- High Technology Lens
- Multifocal lens

The Changing Face of Cataract Surgery

The Baby Boomer Generation

- Large, rapidly growing demographic
- Educated, financially secure
- Increased life expectancy
- Longer working careers
- Demand high quality vision (reading, distance, night vision)
- New requirement for near vision (computers)
- Unwilling to compromise active lifestyles

The Future of Cataract Surgery and the O.D.’s role in Comanagement

- Femtosecond Laser Cataract Surgery
- Image guided technology
- Intraoperative aberrometry

Traditional Cataract Surgery

- Corneal incisions via hand-held blade
- Manually created capsulorhexis via blunt needle or forceps
- Intraocular ultrasonic phacoemulsification for lens aspiration
- IOL Implantation
Do We Need FLACS?

- Cataract surgery already a “good” procedure?
- Only helps less experienced surgeons?
- Wait for technology to improve?
- Several lasers... wait to see which one is best?
- Laser too expensive to justify?
- Don’t believe the hype?

Reproducible Primary and Secondary Incisions

- Computer programmed incisions
  - % depth
  - Length & position
  - Visualization of placement
- Real time corneal thickness
- Customizable “planed” incisions (up to 3)

Manual Arcuate Incisions

- Manually executed by “tracing” corneal marks with handheld diamond knife
- Inconsistent depth control
- Unpredictable effect due to imprecise wound architecture and depth
- No image-guided surgical planning or visualization
Laser Arcuate Incision

- Square edge
- Uniform depth (no ripples)
- Precise, reproducible
  - Arc shape
  - Arc length
  - Diameter

Laser Capsulotomy

Precise and reproducible
- Geometrically superior circle (vs. Manual Capsulorhexis)

Automatic Centration and Size
- Based on limbus and (dilated / undilated) pupil

Capsular Edges
- Closest to manual capsulorhexis in terms of edge uniformity*

* Bala C, Meades K. SEM of femtosecond laser capsulotomy edge: An inter-platform comparison. Accepted for publication in Journal of Cataract and Refractive Surgery

Impact of ELP on IOL Predictability

If IOL is 0.5 mm posterior to the assumed plane, a 21.0 D lens will produce only 20.0 D of correction

If IOL is 0.5 mm anterior to the assumed plane, a 21.0 D lens will produce 22.0 D of correction

Hyperopic  
Myopic

Additional Lens Fragmentation for Versatility

Customizable Lens Fragmentation based on lens characteristics or surgeon preference

Cylinder  
Chop  
Hybrid  
Frag
Benefits of Lowering CDE (Cumulative Dispensed Energy)

- Less ultrasound energy (CDE)
- Short term
  * decreased k edema 1 day post-op
  * faster visual recovery
  * decreases complications intra-op
- Long term
  * decreased rate of endothelial cell loss
  * pseudophakic bullous keratopathy less likely

Important to Explain

What's covered

- Cataract removal
- Monofocal lens resulting in good distance vision if no astigmatism
- Will need readers

What's not covered

- Astigmatism Tx with laser
- Toric lenses
- Multifocal lenses
- Additional testing
- Interoperative Aberrometry


- Subconjunctival heme ("ring around limbus")
- Less AC reaction
- Decreased astigmatism
- Early "wow" factor
- BUT....due to arcuate incisions, there may be temporary corneal surface irregularities
Identifying Sources of Variability in our Current Process

The Verion™ Image Guided System

Designed to help consistently achieve the cataract refractive target.
OR Video - Toric Alignment

The ORA™ System with VerifEye® Technology

- The ORA™ System uses wavefront aberrometry data in the measurement and analysis of the refractive power of the eye (i.e. sphere, cylinder, and axis measurements)
- Real-time, intraoperative refractometer
- Measures anterior and posterior corneal astigmatism
- Minimizes post-op refractive surprises

Post Op Cataract Visits

- It took a long time to get where we are...don’t relinquish post op care
- “I don’t have time”
- “I am not set up for it”
- “I am not sure what to do”

Post Op Cataract Visits

- VA and pinhole at day one, with IOP and slit lamp check
- VA and quick refraction week one if not close to 20/20, with IOP and slit lamp
- VA and final refraction week four

- ***fundus exam at one or four week visit
Confusion is the Rule

• When it comes to pre/post op meds
• Be sure they never stop their glaucoma drops
• Rebound iritis often means steroids were stopped

Imprimis Dropless Therapy™

The modality of “Dropless” therapy involves the injection of an eye-compatible compound at the end of the cataract case as prophylaxis against inflammation and infection.

Currently, there are 2 combinations available only from Imprimis:
• Tri-Moxi: triamcinolone acetonide and moxifloxacin hydrochloride
• Tri-Moxi-Vanc: triamcinolone acetonide, moxifloxacin hydrochloride and vancomycin

Imprimis Dropless Therapy™ Patient Benefits

• Physically/mentally challenged patients
• Eliminate compliance challenges of drops
• Lift burden from family members/caregivers
• Put patients with “Eye Drop Phobia” at ease
• Avoid pharmacy issues: refills, generics
• Help patients in nursing facilities
• Aid patients without insurance, money or access to sample drops

Tri-Moxi-Vanc Transzonular Injection

• Rheumatoid arthritis
• Osteoarthritis
• Scoliosis
• Parkinson’s
• Kyphosis
• Alzheimer’s
• Dementia

• Drop Therapy with branded medications saves over $400
Post-Op Visits: What's Different with LenSx/Premium IOL's?

- **Restor**: check reading vision and find the “sweet spot”
- Until second eye is done, vision may not be optimal
- **Toric**: do a refraction if VA not 20/20 or close

What can affect the results of cataract surgery and premium IOL's?

- Surface disease
- Chalazia
- Pterygia
- Corneal dystrophies and degenerations
- Undetected pre-op retinal conditions
- Post-op CME

Post-Op Visits: What's Different with LenSx/Premium IOL's?

- **LenSx**: check if the under 1 D of astigmatism is reduced
- Check for corneal swelling due to dock, along with “ring around the limbus” sub conj hemorrhage

Take off the Pterygium prior to the Cataract!

- 3 techniques
  - Bare sclera (60%)
  - Amniotic membrane (10%)
  - Conjunctival autograft (5%)
- Mitomycin C cuts recurrence rate in half
- Specimen for pathology
Pterygium Excision

• 69826
• 90 day global period
• 4 post op visits

Pterygium

• POD#1
  • History- Pain/discomfort- may require pain meds for a few days
  • Acuity- should be normal
  • External- Moderate conjunctival injection
  • S/L- be sure corneal epithelium intact

Sutures

• Rarely used unless the graft area is huge
• Fibrin glue better

Drops

• If any sign of recurrence or inflammation, up the steroids
• Even consider a steroid injection
IOP

- Check IOP......
  - If elevated consider steroid response
  - If low, check carefully for wound leak

If in doubt......

- Keep them on lubes and a steroid

Bumpy Corneas could mean Bumpy Post Op

Refraction

- 55 y/o F c/o months of monocular f.b. sensation, contact lens intolerance, tearing, and mild decrease in vision

The most likely diagnosis is:

A. Pellucid degeneration
B. Salzmann’s nodules
C. Granular dystrophy
D. Corneal scarring
Salzmann’s Nodules

- Follows episodes of keratitis
- Collagen plaques with hyalinization
- Anterior to Bowman’s
- Irregular epithelium
- F.B. sensation/photophobia
- Superficial keratectomy

Superficial Keratectomy

Salzmann’s Post Op Visits

- 1 day
- 3-5 days...remove BCL and stop NSAID, start hourly viscous artificial tears
- 1 month

- Progress will be monitored via acuity and corneal healing and topography
- Then set up the cataract surgery!

Microincisional Glaucoma Surgery with Cataract Surgery
MIGS – Micro-Invasive Glaucoma Surgery

- Ab-interno approach
- Clear corneal micro-incision (<2.0mm)
- Conjunctival sparing
- Minimally traumatic
- Negligible disruption of normal anatomy/physiology
- Excellent biocompatibility
- Efficacious
- Extremely high safety profile
- Rapid recovery

iStent® Specifications

iStent is the smallest medical device known to be implanted in the human body and weighs just 60 µg

• iStent dimensions are customized for a natural fit within the 270 µm canal space
• Made of surgical-grade nonferromagnetic titanium
• Heparin-coated to promote self-priming

iStent® Therapeutic Objectives

iStent® is designed to be used in conjunction with cataract surgery to safely and effectively reduce IOP

- Lowers IOP and may reduce or eliminate medication burden
- Decrease risk of IOP fluctuations associated with non-adherence to prescription medication regimens
- Avoid serious complications associated with end-stage filtration and shunt procedures
- Spare the conjunctiva and safely preserve future treatment options
- Minimizes risks of hypotony and bleb related complications

MIGS Study Group

- Prospective study, 119 iStent® patients followed for 18 months
- Patients did not undergo cataract surgery (non-FDA approved)
- All patients on 1-3 glaucoma meds
- Compared IOP after 1, 2, and 3 iStents placed (without Phaco/IOL)
  - IOP = 19.8, 20.1, and 20.4 respectively, before washout
  - IOP = 25.0, 25.0, and 24.9 respectively, after washout
  - IOP = 15.6, 13.9, and 12.3 respectively, 18 months post-op
iStent® Postop Management

• iStent postop no different than standard cataract
• Maintain glaucoma meds
• “Final effect” on IOP not until 2-3 months postop

Typical iStent Patient

• IOP 19-20 on 2 to 3 meds with questionable compliance
• s/p PC IOL with iStent day1
• Leave on all glaucoma meds for 30 days
• IOP drops to 12-14 range
• Start weaning meds, IOP often stays in the low teens!

iStent® Potential Complications

• Hyphema
  1. Minimal
  2. Self absorbing
• IOP spike
  1. Manage as normal postop spike
  2. Topical B blockers, alpha agonists, CAI’s
• PAS to iStent
  1. YAG as necessary

iStent® Summary

• Effective in lowering IOP for many glaucoma patients
• Ideal for COAG patient having cataract surgery
• Decreases or eliminates need for glaucoma meds
• Well tolerated, good safety profile
• Minimally invasive
Finally....... 

- Each surgeon has their own regimen for each procedure 
- “Scrub in” with the surgeon and know their routine and preferences 
- Communication is critical both ways 
- Be accessible to your patients after hours, and be sure to have your surgeon’s cell number 

AND................. 

- SUPPORT THOSE THAT SUPPORT YOU AND OUR PROFESSION..... 
- REGARDLESS OF LOCATION 
- TAKE CHARGE AND SEND TO THOSE YOU TRUST