Course Objectives

1. Recognize the indications and learn new techniques for anterior segment surgery

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   - Gain a better understanding of surgical options for anterior segment repair

Thank You
Course Objectives

- Recognize the indications and learn new techniques for anterior segment surgery
- Gain a better understanding of surgical options for anterior segment repair
- Understand the advantages and disadvantages of different intra-ocular capsular stability devices

Course Faculty

- W. Barry Lee, MD
- John Berdahl, MD
- Brandon Ayres, MD
- Jeremy Kievel, MD
- Elizabeth Yue, MD
- Nicole Fram, MD

Faculty

John Berdahl, MD

- Specializes in advanced Cataract, Corneal and Glaucoma Surgery, in addition to Refractive Surgery
- Medical school at the Mayo Clinic in Rochester, MN
- Residency at Duke University
- Cornea and glaucoma fellowship at Minnesota Eye Consultants
- Research interests include CSF pressure in Glaucoma, Minimally Invasive Glaucoma Surgery, and Refractive Laser Assisted Cataract Surgery (ReLACS).

Nicole Fram, MD

- Residency at Wills Eye Hospital
- Fellowship in Cornea and External Disease and Uveitis at Francis I. Proctor Foundation UCSF
- Clinical Instructor at Jules Stein Eye Institute UCLA
- Expertise in premium cataract surgery, cornea and external disease, as well as anterior segment reconstruction
Faculty
• Boston Native
• Medical school and Residency in Ophthalmology at Boston University and Boston University Medical Center
• Fellowship training in Cornea, External Disease, and Refractive Surgery at Bacom Palmer Eye Institute
• Practices at Lexington Eye Associates with offices in Lexington and Concord, MA
• Interests include corneal transplantation, presbyopic correction, and complex cataract surgery
• Serves on the clinical committee for ASCRS
Jeremy Kievel, MD

Faculty
• Residency at Rush University Medical Center in Chicago, IL
• Fellowship in Cornea, Anterior Segment and Refractive Surgery at Cullen Eye Institute, Baylor College of Medicine
• Assistant Professor of Ophthalmology at Cullen Eye Institute, Baylor College of Medicine
• Virginia Eye Consultants
Capsular Tension Rings
Elizabeth Yeu, MD

Faculty
• Board of Directors and Scientific Chair of the Cornea Society
• Medical director of the Georgia Eye bank
• Partner at Eye Consultants of Atlanta
• Fellowship training at University of California, Davis in Sacramento CA in Cornea, External Eye Diseases, and Refractive Surgery
The Complex Cataract
W. Barry Lee, MD

Faculty
• Residency training at UMDNJ, New Jersey Medical School
• Fellowship in Cornea, External Disease, and Refractive Surgery at Wills Eye Institute, Philadelphia PA
• Cornea Service at Wills Eye Hospital, Philadelphia, PA
• Private Practice at Ophthalmic Partners of Pennsylvania
Iris Repair
Brandon Ayres, MD
Sclerally Fixated Akreos AO60

John Berdahl

Disclosures: Alcon, Allergan, Bausch & Lomb, Glaukos

Advantages
Everybody has a sclera
IOL Fixated First
Good Stability with DSEK
No Correctopia
No Iris Chaffing
No Cheesewireing

Disadvantages
Long Procedure
Avoid blebs
Poor Reimbursement
External Sutures could be cut

Akreos AO 60

Hydrophilic Acrylic
Very Soft Material
Zero Asphericity
4 point Fixation
Small Incision
No Sharp Edges

Scleral Fixation

Steps

1. Block
2. Take down Conj (6 to 8 and 12 to 2 Surgeons view)
3. Cauterize
4. Mark suture locations 4.5mm apart
5. Insert AC maintainer
6. Create 4mm incision at 5 o’clock
7. Remove Old IOL and Vitrectomy
8. Thread distal loops with double armed CIF 9-0 Prolene for mattress suture
9. Externally place docking 27g needle through sclera at suture locations.
10. Repeat 8 & 9 at proximal loops
11. Fold and insert IOL
12. Tighten sutures to center
13. Tie and bury knots
14. Close Conjunctiva

Thank you
Capsular Tension Rings

- Indications
  - <3-4 clock° of zonular loss
  - Mild zonular instability
- Injector or free hand
- Should not be used in anterior capsular tear, a discontinuous capsulorhexis, or a p-cap tear

Capsular Tension Devices

- Standard ring
- Sew-in Ring
  - Cionni CTR: single or double islets
  - Ring segment
  - Ahmed capsular tension segments

Sew-in CTR

- Sutured CTR should be considered for > 4-5 clock hours of zonular loss
- Obviously dislocated lens
- Profound zonular instability

Ahmed Capsular Tension Segments

- Easier than sutured CTR
- Ant or post capsular tear may be okay

Double-armed Non-Dissolvable Suture

- Ethicon® Double-Armed 3" 9-0 CTC-6L (curved) or STC-6L (straight)

Conclusion

- Mild zonulopathy can be managed with a 3-piece IOL in the bag
- Difficulty: CTR < CTS < sew-in CTR
- Always manage vitreous prolapse around areas zonulolysis
- If bag compromised, possible IOL exchange +/- suture fixation
1. **Pearls to Prevent Peril in Complex Cataract Surgery**
   - W. Barry Lee, M.D., F.A.C.S.
   - Cornea Service
   - Eye Consultants of Atlanta
   - Medical Director, Georgia Eye Bank
   - Atlanta, Georgia, USA

2. **Financial Disclosures**
   - Allergan
   - Shire
   - Bausch & Lomb
   - Medevex Imaging Systems
   - BioTissue

3. **When Phaco Is Not Routine**
   - **Small Pupil**
   - **White Cataract**
   - **Traumatic Cataract**
   - **Anterior Capsule Tear**
   - **Intraoperative Floppy Iris Syndrome (IFIS)**
   - **Fuchs Dystrophy**

4. **Small Pupil**
   - **Causes**
     - Mature Cataract
     - Pseudoexfoliation
     - Glaucoma
     - Uveitis (Posterior Synechiae)
   - **Medications**
     - Miotics
     - Prostaglandins
     - Floppy Iris Syndrome (IFIS)

5. **Surgical Options**
   - **Posterior Synechiolysis** (Iris sweep or OVD cannula)
   - **Overfill with OVD**
   - **Pupil Stretching** (Lester or Kuglen hooks)
   - **Iris Hooks**
   - **Pupil Expansion Devices** (Graether, Morcher, Oasys, Malyugin ring)

6. **Pupil Expansion Devices**
   - **Posterior Synechiae / Malyugin ring Insertion**
     - **White Cataract / Small Pupil / IFIS**

7. **White Cataract**
   - **Challenges**
     - Difficulty with Anterior Capsule View
     - Often associated with small pupil
     - Zonular laxity more common
     - Anterior capsule staining techniques
     - Trypan blue
     - Indocyanine green

8. **21-Gauge to Aspirate/lower intracapsular pressure**

9. **Traumatic Cataract**
   - **Preoperative exam**
   - **History**
     - Phacodonesis?
     - Vitreous prolapse?
     - Iris sphincter damage? (Poor dilation)
     - Phaco / Extracapsular / Intracapsular technique?

10. **Anterior Capsule Tear**
    - **Concerns & Considerations**
      - Extension to posterior capsule
      - Posterior capsule rupture / Vitreous loss
      - Lens implant stability
      - Placement of lens in bag or sulcus?
      - Lens implant (3-piece or 1-piece)?
    - **Anterior Capsule Tear Pearls**
      - Refill with cohesive OVD to attempt save
      - Can reverse direction of capsulorrhexis
      - Canopener capsulorrhexis can help if lost peripherally
      - Only gentle hydrodissection

11. **Reverse the rhexis to rescue ant. tear**

12. **IfIS- Preoperative Tips**
    - **Not Helpful**
    - Pre-operative topical atropine
    - Discontinuation of alpha-blockers

13. **Surgery Pearls for IFIS**
    - **Well-constructed incision**
    - Triplanar
    - Lengthen tunnel
    - Lower fluids
    - Gentle Hydrodissection
    - Lower bottle for phaco
    - Irrigation/aspiration

14. **Fuchs Dystrophy (FECD)**
    - Hereditary endothelial dystrophy
    - International Committee for Classification of Corneal Dystrophies (1)
    - COL8A2 gene, SLC4A11 gene (2)
    - Onset (4th - 5th decades)
    - Premature aging of endothelium
    - Guttae develop centrally and extend peripherally
    - Epithelial and stromal edema
    - Ultimate haze and vascularization

15. **High Power View of Endothelium**

16. **Keys to Success**
    - Appropriate patient selection & surgical decision making
    - Alteration of incision site
    - Use of protective ophthalmic viscosurgical devices (OVD’s)
    - Limit fluid irrigation time
    - Limit nucleus removal time
    - Postoperative medication regimen (Longer steroid use)

17. **Refractive Outcomes of DSAEK**

18. **IOL Opacification**
    - Has been described in eyes following DSAEK after cataract surgery
    - Occurs with Hydrophilic acrylic lenses
    - Hydroxyapatite deposition on IOL surface
    - Often requires IOL exchange

19. **Conclusions**

20. **Every cataract surgery is different**
    - Be prepared for special situations that add complexity to cataract surgery
    - Familiarize yourself with the different devices to improve cataract surgical skill and efficiency in challenging cases
    - Difficult cases can be made routine when adjunct devices are mastered

21. **Ernst Fuchs (1851-1930)**

Indications for IOL exchange

- Refractive error
- Anisometropia
- Refractive surprises/post excimer laser vision correction
- Toric errors
- Visual symptoms
  - Positive dysphotopsia
  - Negative dysphotopsia
  - Inadequate visual function
- Malpositioned IOL
  - Zonulopathy- PXF, trauma, uveitis, RP, long AL
  - Iatrogenic causes
  - Therapeutic indication
- UGH syndrome
- IOL deposits
  - Calcifications
  - ?Glistenings

Prepare for surgery!

- Know the history
- Slit lamp exam:
  - Capsule/capsulotomy status
  - Zonular status
  - Endothelial cell status
  - Incision locations/astigmatism
  - IOL type
  - Position of the haptics
- Exchange vs. Reposition
- Pars plana vs. limbal approach
- Pt expectations, CME, capsular compromise, open capsules

Financial Disclosures

- Alcon, speaker
- Abbott Medical Optics, consultant/speaker
- Shire, consultant/speaker
Surgical procedure

- Retro/peribulbar block
- Instrumentation
  - Viscoelastics
  - Viscodisection: 27g needle vs cannula vs. bimanual
- Iris hooks
- Capsular retractors
- Lens manipulators
- Microsurgical forceps and scissors
- Vitrector
- Triesence®
- Suture

Out with the old...

- Removing the IOL from the bag
  - Entirely
  - Amputate haptics
- Removing the IOL from the eye
  - Cut
  - Fold
  - Dial
  - Pull

In with the new...

- Where to put it:
  - In the bag
  - In the sulcus
  - Optic capture
  - ACIOL
- Inject new IOL before taking out old
- Iris fixation
  - McCannell suture
  - Seipser knot
- Scleral fixation

Iris Repair
Brandon D. Ayres, MD
ASCRS 2015
SanDiego, CA

Financial Disclosure
- Alcon
- Allergan
- Bausch and Lomb
- Bio-Tissue
- Micro Surgical Technology
- Rapid Pathogen Screening
- Omeros
- Shire

Why Repair the Iris

- Not all iris defects need repair
- Small traumatic iris defects
- Peripheral iridotomy
- Iris capture after large incision cataract surgery
- Symptomatic iris defects need repair
- To assist with another anterior segment procedure

Major Categories

- Iridodialysis (usually from trauma)
- Sphincter tears leading to irregular pupil
- Loss of tissue from trauma
- Atonic pupil
- Aniridia

Iridodialysis

- Commonly seen in ocular trauma
- Can be surgically induced
- Watch for zonular loss in area of dialysis, makes cataract surgery more challenging
- Timing is important
- Wait long enough for inflammation to clear
- Waiting too long may make the repair very difficult

Technique

- Needle: CIF-4 or STC-6 10-O prolene
- Needles enter through small incision
- Use guide needle through sclera or pocket
- Tie sutures after all mattress sutures placed
64 Year old woman s/p shovel injury to eye leaving her with corneal scar, aphakia, and with iridodialysis.

**Iridodialysis Repair**

**Open Sky**

**Technique**

- Needle: Curved needle (CIF-4) 10-O prolene
- Needles enter through small incision
- No exit incision is needed
- Tie knot using a sliding knot technique

### Atonic Pupil

- Large dilated pupil can be difficult to close
- Large pupil can cause glare in phakic and pseudophakic patients
- Can be helpful to use prosthetic lens to see if symptoms resolve before surgical intervention

**Etiology**

- Idiopathic
- Orbital trauma
- Herpes Zoster Infection
- Diabetes
- Autonomic neuropathies (Riley Day)
- Guillain Barre syndrome
- Narrow angle glaucoma

**Surgical Management**

1. Paracentesis necessary
2. Carefully pass suture through pupil border in baseball style
3. Exit through paracentesis using a cannula so you don’t grab fibril of cornea
4. After 4th pass tie knot and adjust size

**Available Devices**

- There is currently no FDA approved iris prosthesis device
- The Dr. Schmidt/HumanOptics Artificial Iris is currently under US FDA clinical trials to evaluate safety and efficacy, and is available for compassionate use under the clinical trial.

### Aniridia

**Etiology**

- Traumatic: Penetrating trauma or surgical trauma
- Congenital
- 2/3 familial and 1/3 sporadic
- Autosomal dominant, from mutation in PAX6 gene on chromosome 11
- May be associated with WAGR syndrome

**Available Devices**

- Other less common causes
  - ICE Syndrome
  - Regan’s aniridia and other anterior segment dysgeneses
  - HDY and HEY

**Other Available Devices**

- Multiple types of iris prostheses
  - Modified CTR
  - Optics
  - Merck and other IOLs
  - Dr. Schmidt/HumanOptics silicone artificial iris
  - Dr. Schmidt Al

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**Color Match**

- Systems
  - Ophtec
  - Morcher
  - Dr. Schmidt AI
Summary

Iris repair can be very rewarding for both physical and patient. Multiple techniques may need to be used for successful repair. In cases where repair is not possible, prosthetic devices may be available in future to help alleviate patient symptoms and enhance cosmesis.

Thank You

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