CORNEAL DISEASE IN CATARACT SURGERY

Laurence T. D. Sperber, MD
Clinical Professor
Residency Program Director
Director, Cornea Service
Department of Ophthalmology
New York University School of Medicine
61st Annual Rochester Ophthalmology Conference
Flaum Eye Institute, Rochester, NY

Financial Disclosures

- None

Introduction

- Discussion of the decision-making process related to performing cataract surgery in patients with corneal disease
  - Fuchs' Endothelial Dystrophy
  - Herpes Simplex Keratitis
  - Keratoconus
- Discussion of correction of post surgical refractive error

Fuchs' Endothelial Dystrophy

- Preoperative evaluation
  - Careful history
  - Slit lamp examination
  - Pachymetry
  - Specular Microscopy

Fuchs' Endothelial Dystrophy

- Surgical decision-making
  - History - vision worse in AM, better as day progresses, suggestive of corneal edema
  - Slit lamp exam - clinical edema
    - Epithelial
    - Stromal +/- Descemet's Folds

Fuchs' Endothelial Dystrophy

- Surgical decision-making
  - Specular Microscopy
    - Examination of endothelial cell morphology and number
      - Cell count < 1000 cells/mm^2 concerning
      - **Use as a guide - no set numbers necessitate performing triple procedure (DSAEK or DMEK/CE/IOL)**

Fuchs' Endothelial Dystrophy

- Surgical decision-making
  - Pachymetry - measurement of corneal thickness
    - Excellent gauge of endothelial cell function
    - Most useful in choice of surgical procedure

Fuchs' Endothelial Dystrophy

- Surgical decision-making – no set numbers
  - Pachymetry < 0.6mm with no corneal edema by exam or hx
    - Cataract Extraction alone
  - Pachymetry > 0.6 mm
    - Consider Triple procedure (DSEK/DMEK c CE/IOL)

Fuchs' Endothelial Dystrophy

- With proper selection of surgical procedure, excellent results can be expected
  - Triple procedure (DSAEK vs DMEK/CE/IOL) - good prognosis
  - Cataract extraction: if done atraumatically - less/no edema

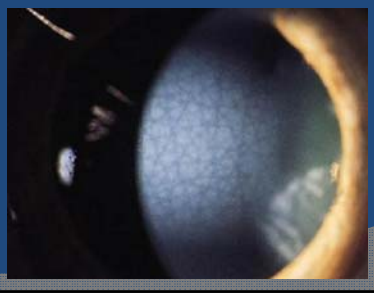
Fuchs' Endothelial Dystrophy

- Important to carefully discuss with patient
  - Cataract surgery alone may still cause corneal decompensation
  - Triple procedure postoperative visual recovery slower than CE/IOL alone

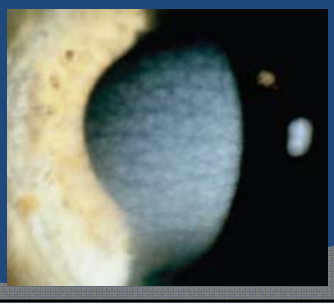
Conditions often confused with Fuchs'

- Conditions with similar appearance to Fuchs' Dystrophy
  - Other corneal dystrophies (ie: Macular, Central Cloudy Dystrophy of Francois, Posterior Crocodile Shagreen, Posterior Amorphous Stromal, Posterior Polymorphous, Meesemann's, Reis-Bucklers')
  - Herpes Simplex stromal keratitis
  - Interstitial Keratitis

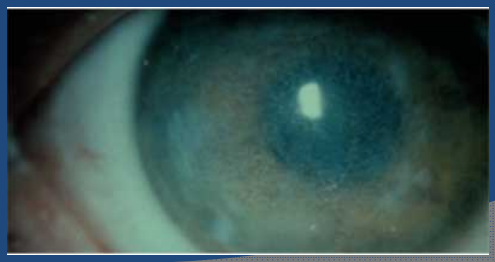
Posterior Crocodile Shagreen



Central Cloudy Dystrophy of François



Reis-Buckler's Corneal Dystrophy



Conditions often confused with Fuchs'

- Differentiation:
  - History
  - Slit lamp examination
  - Pachymetry

Surgical Decision-Making

- Do the best procedure based on clinical situation
  - Density of nucleus
  - Pupil size
- Planned ECCE vs Phaco
  - Can have an excellent result with either technique

Phacoemulsification Techniques

- When proceeding with Phaco/IOL alone, the goal is to perform surgery with minimal trauma to corneal endothelium
- Can be achieved by careful technique
  - Minimize anterior chamber turbulence
  - Endolenticular phaco
  - Liberal use of dispersive viscoelastic

Triple Procedure Techniques

- DSAEK or DMEK/Phaco/PCIOL
  - Standard Phaco/PCIOL technique
  - Careful removal of viscoelastic – use a cohesive viscoelastic
    - Residual viscoelastic can interfere with adherence of DSAEK/DMEK tissue
  - Standard DSAEK/DMEK technique
  - Must adjust IOL calculations as typically see a hyperopic shift in Endothelial Keratoplasty
    - About 1 D with DSAEK
    - About 0.5 D with DMEK

Jun et al. Cornea 2009 Jan;28(1):19-23
Price et. al. Ophthalmology 2009 Dec;116(12):2361-8.

Herpes Simplex Keratitis

- Stromal Keratitis
- Epithelial Keratitis
- Concerns about reactivation after intraocular surgery
  - Cataract surgery
  - Corneal transplantation

Herpes Simplex Keratitis

- Wait at least 4-6 months after last clinical activity
- Prophylaxis with oral Acyclovir/Valtrex/Famvir
  - Acyclovir – 400 mg PO BID
  - Valtrex – 500 mg PO BID
  - Famvir – 250 mg PO BID
- Aggressive treatment of postoperative inflammation
  - Consider PO steroids if severe

Keratoconus and Cataract Surgery

- Can be a difficult management decision
- Must first assess contribution of Cornea to decreased vision
  - Optimize vision with RGP Refraction
- Choice of IOL – Decision-making process dictated by Corneal Stability
  - Toric vs. Standard IOL?
  - Multifocal IOL?

Keratoconus and Cataract Surgery

- If need both PK/DALK and CE/IOL - ?do as triple?
  - Better as staged procedure with PK/DALK first
  - Combined procedure, difficult to predict spherical equivalent and astigmatism post op

Management of Residual Refractive Error in Cataract Surgery

- Cataract Surgery = Refractive Surgery
  - Goal is not only best corrected visual acuity, but best uncorrected VA
    - Especially true with Premium IOLs
- Optimize refractive results
- Careful choice of procedure to correct refractive error
- How soon can you do the procedure?

Management of Residual Refractive Error in Cataract Surgery

- Refractive stability
- Corneal topographic stability
- Standard preop workup
  - Refraction
  - Slit Lamp/fundus
    - Evaluate eye, ocular surface in particular
  - Pachymetry
- Wavescan

Management of Residual Refractive Error in Cataract Surgery

- Options?
  - Limbal Relaxing Incisions
    - Femtosecond Laser vs Manual
  - Laser Vision Correction
    - LASIK vs PRK
  - IOL Rotation/Exchange
- Decision-making process - understand patient's symptoms
  - Amount of residual myopia/hyperopia
  - Amount of residual astigmatism

Summary

- Corneal Disorders present different challenges in Cataract surgery
- Recognizing the problems and management issues key to selection of best procedures
- Optimal presurgical planning and surgical decision-making leads to excellent surgical results

THANK YOU