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Title: Cataract and Refractive Postoperative Complications

Description: A series of challenging cataract and refractive postoperative complications with exam-style questions throughout

Course objectives:

-Discuss how to correctly identify common and uncommon complications following cataract and refractive (Lasik, PRK, LRI, ICL) surgeries.
-Discuss how to properly manage and treat these complications
-Check knowledge throughout using exam style questions throughout and discuss approaches to answer these questions correctly

Outline:

I. Introduction and Learning Objectives

A. Recognize common and uncommon postoperative complications following cataract and refractive surgery
B. Differentiate complications with overlapping clinical presentations
C. Select appropriate diagnostic testing and management
D. Apply clinical findings to exam-style multiple-choice questions
E. Develop a systematic approach based on **timing, symptoms, examination findings, and mechanism**

II. Case 1 — Acute Postoperative Endophthalmitis

A. Presentation

- Six days after uncomplicated phacoemulsification/IOL
- Acute redness, discomfort, and severe vision loss
- Light-perception vision
- Vitreous opacities on B-scan with attached retina

B. Diagnosis

- Key elements are vitritis and less-acute (than TASS) onset

C. Management principles

- Role of vitreous tap/inject versus pars plana vitrectomy
- Intravitreal antibiotic therapy

- Importance of presenting visual acuity in determining management
- LP-only vision → immediate PPV plus intravitreal antibiotics
- Hand motions or better → tap/inject may be appropriate
- Limitation: EVS study only examined post-CEIOL endophthalmitis

III. Case 2 — Toxic Anterior Segment Syndrome

A. Presentation

- Postoperative day 1 after uncomplicated cataract surgery
- Marked limbus-to-limbus corneal edema
- Anterior chamber inflammation/fibrin
- Elevated IOP
- Clear vitreous

B. Distinguishing TASS from infectious endophthalmitis

- Very early onset
- Anterior-segment-predominant inflammation
- Clear vitreous
- Relatively limited pain

C. Management

- Intensive topical corticosteroids
- IOP-lowering therapy
- Investigation of possible surgical-center source
- Review sterilization, instrument rinsing, medications, and drug dilution

IV. Case 3 — Postoperative Refractive Surprise

A. Presentation

- Unexpected large myopic error following otherwise uncomplicated surgery
- Centered PCIOL

B. Etiologies of postoperative refractive error

- Axial-length measurement error
- IOL calculation error
- IOL position/configuration
- Capsular block syndrome
- Ocular pathology affecting postoperative refraction

C. Exam pearl

- Approximately 1 mm axial-length error → roughly 2.5–3.0 D refractive error
- Dense cataracts may interfere with optical biometry and necessitate alternative measurements

V. Case 4 — Capsular Block Syndrome

A. Delayed fluctuating vision and new myopic shift
B. Distended capsular bag with anterior displacement of the IOL
C. Role of anterior-segment OCT
D. Treatment with Nd:YAG posterior capsulotomy
E. Differentiate from pupillary block, IOL malposition, and inflammatory causes

VI. Case 5 — Retained Lens Fragment

A. Postoperative photophobia, blurred vision, inflammation, elevated IOP, and focal corneal edema
B. Lens material → macrophages/inflammatory debris → trabecular obstruction
C. Small cortical fragments versus retained nuclear material
D. Recognition of cases requiring surgical removal

VII. Case 6 — Uveitis-Glaucoma-Hyphema Syndrome

A. Markedly elevated IOP with pigment/inflammation after IOL surgery
B. Mechanical iris chafing from an improperly positioned IOL
C. Diagnostic evaluation

- Gonioscopy
- UBM
- RNFL evaluation
- Distinguishing trabecular obstruction from elevated episcleral venous pressure

D. Definitive treatment

- Reposition, secure, or exchange offending IOL
- Address secondary glaucoma when necessary

Transition to Refractive Surgery

IX. Case 7 — Diffuse Lamellar Keratitis

A. Presentation

- Days 1–3 following LASIK
- Fine white granular interface cells
- Minimal pain
- No epithelial defect, focal infiltrate, or significant AC reaction

B. Staging and progression

- Peripheral inflammation → central extension → dense central clumping
- Advanced disease may cause stromal damage/scarring and refractive change

C. Management

- Early disease: intensive topical corticosteroids
- Close follow-up
- More advanced disease: flap lift and irrigation

D. Exam differentiation

- DLK versus infectious keratitis
- Sterile diffuse interface inflammation versus focal infectious infiltrate

X. Case 8 — Post-LASIK Epithelial Ingrowth

A. Risk factors

- Flap-lift enhancement
- Epithelial defects
- Poor flap apposition
- Prior microkeratome flap

B. Clinical appearance

- Gray-white epithelial nests originating from flap edge
- Progressive extension toward visual axis
- Irregular astigmatism and visual symptoms

C. Management by severity

- Small, peripheral, stable ingrowth → observation
- Progressive/visually significant ingrowth → flap lift and epithelial removal
- Scrape both stromal bed and undersurface of flap
- Flap sutures/fibrin glue or other measures when needed to reduce recurrence

XI. Case 9 — Post-LASIK Corneal Ectasia

A. Presentation

- Progressive visual deterioration years after LASIK
- Increasing irregular astigmatism
- Marked corneal thinning/steepening

B. Risk factors

- Abnormal preoperative topography
- Thin residual stromal bed
- Young age
- High correction
- Repeat enhancement

C. Management spectrum

- Specialty contact lenses
- Corneal cross-linking in appropriate earlier disease
- Intrastromal corneal ring segments in selected cases

- Keratoplasty for advanced disease

D. Advanced ectasia

- DALK when severe stromal disease exists with healthy endothelium
- Avoid further tissue-removing ablation in an unstable, severely thinned cornea

XII. Case 10 — Granular Corneal Dystrophy Type 2 After LASIK

A. Presentation

- Progressive blur and glare years after LASIK
- Gray-white granular deposits concentrated at flap interface

B. Pathophysiology

- TGFBI-associated corneal dystrophy
- LASIK may accelerate deposition at the interface

C. Preoperative screening

- Subtle anterior stromal deposits
- Family history
- Genetic testing when indicated

D. Management

- PTK
- Flap lift/deposit removal
- Keratoplasty in advanced cases
- Recognition that deposits may recur

E. Pathology/exam correlation

- Hyaline deposits → Masson trichrome
- Amyloid component → Congo red
- Differentiate from macular and lattice dystrophies

PHAKIC IOL COMPLICATIONS & HIGH-YIELD SYNTHESIS

XIII. Case 11 — Surgical Correction of High Myopia

A. Young patient with approximately −15 D myopia
B. Clear crystalline lens and adequate corneal thickness
C. Comparison of surgical options

- PRK

- LASIK
- Refractive lens exchange
- Implantable Collamer Lens

D. Why ICL is favored

- Avoids excessive corneal tissue removal
- Preserves accommodation
- Provides correction of high refractive errors beyond appropriate corneal-laser ranges

XIV. ICL/Postoperative Complications

A. Progressive endothelial cell loss

- Need for longitudinal endothelial monitoring
- Potential for eventual corneal decompensation

B. Other phakic IOL complications

- Pupillary block
- Cataract formation
- Pigment dispersion
- IOL dislocation

C. Importance of vault

- Low vault → increased anterior subcapsular cataract risk
- High vault → increased angle-closure risk

D. Exam distinctions

- PCO requires a capsular bag and therefore does not occur from an ICL in an otherwise phakic eye
- Corneal ectasia is associated with corneal tissue removal rather than ICL implantation