Practical Management of the Most Common Corneal Conditions

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Course Abstract:

Take a practical approach to corneal disease management. From microbial keratitis and neurotrophic keratitis to ectasia and endothelial dysfunction, you'll gain practical insights into what to do and what's next for these common corneal diseases.

Learning Objectives:

1. Review practical treatment approaches for microbial keratitis, neurotrophic keratitis, ectasia, and endothelial dysfunction.
2. Understand advanced diagnostic tools for corneal diseases.
3. Explore innovative new treatments.

Course Outline:

1. Microbial Keratitis
    a. History
        i. Contact lens wear
            1. Extended wear highest risk
        ii. Immunocompromised
    b. Diagnostics
        i. Traditional agar plating
            1. Blood
            2. Chocolate
            3. Sabouraud
                a. Standard of care for cultures
                b. Limitations frequent replacement and refrigeration
            4. Slides
            5. Universal Transport Medium
            6. Submit to lab, wait for ID and sensitivities
        ii. PCR swabs
            1. 24hr results with sensitivities
                a. Easy storage in practice
        iii. Confocal microscopy
            1. Acanthamoeba keratitis
                a. Cysts and trophozoites visible
        iv. Corneal biopsy
            1. Pathology after tissue removal
            2. Last resort

- c. Treatment
  - i. First line
    1. Moxifloxacin and Polymyxin/Trimethoprim
    2. Fortified antibiotics
       - a. Vancyomicin and Tobramyomicin
       - b. Option for office storage
  - ii. PACK-CXL
    1. Future: CXL reaction sterilizes
       - a. No clinically significant differences in outcomes versus traditional management
  - iii. Pipeline meds
    1. Acanthamoeba

2. Corneal Neuropathy
   - a. Diagnostics
     - i. History
       1. Herpetic keratitis
       2. Diabetes
       3. Corneal refractive surgery
       4. Long term contact lens wear
       5. Heavy BAK
     - ii. Corneal sensitivity
       1. Quality vs quantity
          - a. Swab fiber
            - i. Quality, Comparative, Y vs N, More vs Less, high variability
          - b. Aesthesiometer
            - i. Quantity, less than 4 reduced sensitivity, regional
          - c. Non contact aesthesiometer
            - i. Quantitative
              1. Hyposensitive
              2. Hypersensitive
     - iii. Confocal Microscopy
       1. Nerve morphology
          - a. Tortuosity and nodules
   - b. Treatment
     - i. Elimination of exacerbating contributors
       1. Change to preservative free
     - ii. Lubrication
     - iii. Protection
       1. Bandage soft lens
       2. Scleral Lens
       3. Tarsorrhaphy
     - iv. Pharma
       1. Cenegermin-bkbj

2. Pipeline

v. Regeneration
    1. Autologous serum
    2. Amniotic membrane
    3. Nerve transplantation
    4. BMAK
        a. Transplantation of descemet membrane
        b. Acts at substrate for epithelial cell proliferation

3. Corneal Ectasia
    a. Diagnostics
        i. Topography
            1. I-S
            2. Axis skew
            3. Radius of curvature
        ii. Tomography
            1. Anterior elevation
            2. Posterior elevation
            3. Global pachymetry
            4. Epithelial thickness
            5. Next generation OCT
                a. In-vivo corneal biopsy
        iii. Biomechanics:
            1. Contact
                a. Scheimpflug pneumatic
                    i. Applanation time
                b. OCT elastography
                    i. Homogenous anterior and posterior strength
            2. Non contact
                a. Brillouin microscopy
                    i. Focal spectral shift
                b. Phase Decorrelation OCT
                    i. Full corneal analysis
    b. Treatment
        i. Reinforce
            1. CXL
                a. Various forms
                    i. Epi-off
                b. Pipeline
                    i. Epi-on
                    ii. Epi-on plus oxygen
                    iii. Laser diode
            2. Pharma
                a. Pipeline
                    i. LOX upregulation

ii. Regenerate lost collagen

ii. Recontour

1. Subtract
    a. TGPRK
        i. Selective minimal tissue removal
2. Add
    a. ICRS
        i. PMMA
        ii. Synthetic material may lead to complications
    b. CAIRS
        i. Fresh corneal tissue shaped ring segment
        ii. Overcome limitations of synthetic material
    c. CTAK
        i. Sterilized Allograft Tissue
            1. Gamma sterilization
            2. Extents the gift of donation to multiple recipients
    d. BLT
        i. Bowman's layer onlay
3. Replace
    a. DALK
        i. Innovations
            1. Vital et al Grip and Rip technique
    b. PK
        i. Continued decline in use

4. Endothelial Dysfunction
    a. Diagnosis
        i. Specular Microscopy
            1. Endothelial cell morphology
        ii. Tomography
            1. Corneal thickness
            2. In Vivo optical biopsy
                a. Visualization of endothelial layers
    b. Treatment
        i. EK
            1. DSAEK
                a. Stroma, DM, and endo
            2. DMEK
                a. DM and endo only
                b. More challenging procedure
        ii. DSO/DWEK
            1. No donor material required
            2. Long visual recovery
        iii. Artificial Endothelium

        1. HEMA/MMA copolymer
    iv. Endothelial Cell Culture
        1. Injected cells to repopulate endo