Therapeutic Contact Lenses for Ocular Surface Disease

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Course Length: 1 hour

Abstract:
Wanna learn how to use contact lenses for more than just vision correction? Then this lecture is for you! The course will give an overview of therapeutic applications of contact lens from soft to scleral to treat ocular surface diseases.

Learning objectives:

1. Review currently available contact lens modalities and understand various applications of lenses for therapeutic purposes
2. Present challenging cases by use of contact lens case reports
3. To inform of upcoming therapeutic contact lenses innovations and technologies

Outline:

1. Overview of various CL modalities
    a. Routine/Commercial Soft
        i. Accommodate most common (normative data-based) corneal shapes and Rx
    b. Custom Soft and Gas Permeable
        i. Accommodate nearly any ocular shape and Rx
            1. Custom soft
            2. Corneal/ intralimbal
            3. Hybrid
            4. Scleral
            5. Ortho-K
2. Ocular surface disease
    a. Compromised ocular surface tissue integrity
        i. Multitude of disease states
            1. Neurotrophic Keratitis
            2. Exposure Keratitis
            3. Dry Eye Syndrome
            4. Graft vs Host Disease
            5. Steven Johnson Syndrome
            6. Ocular Cicatricial Pemphigoid
            7. Chemical Burns
            8. Limbal Stem Cell Failure
            9. Sjogren's Syndrome

10. Persistent Epithelial Defect

b. TFOS DEWS II describes logical flow and work up
    i. Not specific to Ocular Surface Disease
        1. Made for Dry Eye Disease
    ii. However, many overlaps in treatment strategy
    iii. Mostly with step 3 & 4 treatment
        1. Step 3 = Blood and Shelter
            a. Soft lens
            b. Scleral lens

c. Soft therapeutic lens
    i. Most common use:
        1. Post-op corneal wound healing
        2. Abrasion coverage
        3. OSD protection
            a. Protects surface
                i. Decreases necrosis and desquamation
                ii. Allows for the acceleration of wound healing
                iii. May prevent the need for tarsorrhaphy
            b. FDA approval therapeutic indication
                i. 30 days
                    1. balafilcon A
                    2. lotrafilcon A
                ii. 7 day
                    1. senofilcon A
            c. Benefits:
                i. Readily available
                ii. Fits most normal corneas
            d. Microbial keratitis risk
                i. MK risk in soft lens wear
                    1. Gifford et al
                        a. Risk highest amongst extended wear
                        b. Not specific to OSD
                ii. Topical antibiotic prophylaxis (ALWAYS)
                    1. Moxifloxacin (non-preserved)
                    2. Monitor for MK (fungal)
                iii. Reduce steroid if possible
            e. Role for custom soft non FDA-approved SCL
                i. Irregular corneas, keratoprosthesis (K-pro), and bleb leaks
                    1. Require more customized parameters
                        a. 12 to 24mm
                        b. BC 6.8 to 9.8
            f. Replace BCL often

i. Patient handling considerations
1. Good = replacement by patient
2. Bad = monthly replacement in office

g. Retainer for amniotic membranes

4. Allergic conjunctivitis
a. Antihistamine extended release

ii. Scleral lens use
1. Mechanical protection
2. Continuous hydration
a. Lens creates an artificial environment
b. Under the lens the cornea and ocular surface can thrive and reach homeostasis
c. PROSE= Prosthetic Replacement of Ocular Surface Environment

iii. FDA approval: Materials, not designs
1. hexafocon A, hexafocon B, roflufocon D, and roflufocon E

iv. Benefits:
1. Decreasing treatment burden
2. Reduce the use of ocular lubricants
3. Improve quality of life

v. Considerations
1. Consider handling and tools to help
2. Acute corneal response
a. Can the cornea handle the induced stress?
b. Reduced VA
i. Sattler's Veil?
1. Microcystic edema & bullae
a. Check IOP
2. Tomography
a. Increase in corneal thickness

3. S/P Glaucoma filtering procedure
a. Large diameter lenses resting on tube
i. Repeated abrasion over the tube
1. Tube exposure = risk for infection
a. Endophthalmitis

b. Custom Scleral
i. Impression
ii. Notch
iii. Channel
iv. Peripheral elevation
1. Monitor closely

vi. Indications
1. Therapeutic treatment of OSD
a. Schornack et al

        i. Improved comfort and resolution of keratopathy
        ii. Improved VA by >2 lines
        iii. Undifferentiated OSD, Exposure, NK
    b. Romero-Rangel et al
        i. SJS, OCP, SLK, Exposure, Post Herpetic Keratitis, MGD
        ii. 92% improved quality of life
    c. Asghari et al
        i. OSDI improved by 56%
2. PED treatment
    a. Lim et al
        i. No preserved antibiotic prophylaxis in the reservoir
    b. Cirasky et al
        i. Standardized approach
        ii. 24hr wear
        iii. Removal for disinfection
        iv. Addition of non-preserved antibiotic (moxifloxacin)
3. Decemetocele
    a. Xu et al
        i. Temporization of descemetocele
    b. Gelles et al
        i. Resolution of descemetocele
4. Neovascularization
    a. Lim et al
        i. Addition of Bevacizumab improved NV
    b. Yin et al
        i. Effective in treating NV and improving vision with durable response and no complication.
5. Opacity
    a. Cressey A et al
        i. Neovascular regression
            1. No adjunct topical treatment
    b. Cressey A et al
        i. 4 case retrospective
    c. Gelles et al
        i. Resolution of Lipid K based opacity
6. Infections Keratitis
    a. Polabia-Baron et al
        i. Antibiotic reservoirs
            1. Resolution of 9 of 12
                a. 3 failed - unresponsive to treatment
            2. No complications or side effects were observed