Contact Lenses Beyond Vision Correction

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Abstract:
Do you want to learn to use contact lenses for more than just vision correction? This lecture is for you! This course explores therapeutic and cosmetic applications, including ocular surface disease management, post-surgical care, and innovative uses like drug delivery with both soft and rigid lens designs.

Learning objectives:

1. Understand currently available contact lens modalities and understand various applications of lenses for therapeutic and cosmetic purposes
2. Become knowledgeable of challenging cases by use of contact lens case reports
3. Obtain knowledge of upcoming therapeutic contact lenses innovations and technologies

Outline:

1. Ocular surface disease
    a. Compromised ocular surface tissue integrity
        i. Multitude of disease states
            1. Systemic
2. TFOS DEWS III
    a. Diagnosis
    b. Treatment strategies
        i. Soft lens
        ii. Scleral lens
3. Current clinical applications
    a. 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 for therapeutic indication
                    i. 30 day
                        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 (*CLAE* 2020)
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. 12mm to 24mm
b. BC 6.8 to 9.8
ii. Replace BCL often
1. Patient handling considerations
a. Good = replacement by patient
b. Bad = monthly replacement in office
iii. Tints
1. Photophobia
2. Headache
3. Migraine
4. Sports
iv. Cosmesis
1. Central clear pupil
v. Occlusion
1. Diplopia
2. Black central pupil
3. Customize the optic zone
vi. Retainer for amniotic membranes
4. Drug delivery for allergic conjunctivitis
a. Antihistamine extended release
i. Reduced symptoms by half compared to the control
ii. No longer distributed in US

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

2. FDA approval: Materials, not designs
    a. hexafocon A, hexafocon B, roflufocon D, and roflufocon E
3. Benefits:
    a. Decreasing treatment burden
    b. Reduce the use of ocular lubricants
    c. Improve quality of life
4. Considerations
    a. Consider handling and tools to help
    b. Acute corneal response
        i. Can the cornea handle the induced stress?
        ii. Reduced VA
            1. Sattler's Veil?
                a. Microcystic edema & bullae
                    i. Check IOP
                    ii. Evaluate global pachymetry
                b. Tomography
                    i. Increase in corneal thickness
    c. S/P Glaucoma filtering procedure
        i. Large diameter lenses resting on tube
            1. Repeated abrasion over the tube
                a. Tube exposure = risk for infection
                    i. Endophthalmitis
        ii. Custom Scleral
            1. Impression
            2. Notch
            3. Channel
            4. Peripheral elevation
        iii. Monitor closely
            1. Check IOP
            2. Optic nerve with dilated examination, optic nerve OCT, visual field, fundus imaging
5. Indications
    a. Treatment of OSD
        i. Schornack et al (*Ophthalmology* 2014)
            1. Improved comfort and resolution of keratopathy
            2. Improved VA by >2 lines
            3. Undifferentiated OSD, Exposure, NK
        ii. Romero-Rangel et al (*Am J Ophthalmology* 2000)
            1. SJS, OCP, SLK, Exposure, Post Herpetic Keratitis, MGD
            2. 92% improved quality of life
        iii. Asghari et al (*Clin Optom* 2022)
            1. OSDI improved by 56%
    b. PED treatment
        i. Lim et al (*Am J Ophthalmology* 2013)

1. No preserved antibiotic prophylaxis in the reservoir
2. Cirasky et al. (*Ocul Immunol Inflamm* 2015)
    a. Standardized approach
    b. 24hr wear
    c. Removal for disinfection
    d. Addition of non-preserved antibiotic (moxifloxacin)

c. Emphasis on collaborative care
    i. Cornea / Oculoplastic / Glaucoma / Retina / Low vision