

Therapeutic Contact Lenses for Ocular Surface Disease

John D. Gelles, OD

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 the therapeutic applications of contact lenses, from soft to rigid, for various ocular surface diseases. Unique applications such as drug delivery will be covered.

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:

Start:

1. Ocular surface disease
 - a. Compromised ocular surface tissue integrity
 - i. Multitude of disease states
 1. Systemic
2. TFOS DEWS II describes logical flow and work up
 - a. Not specific to Ocular Surface Disease
 - i. Made for Dry Eye Disease
 - b. However, many overlaps in treatment strategy
 - c. Mostly with step 3 & 4 treatment
 - i. Step 3 = Blood and Shelter
 1. Soft lens
 2. 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 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
 - ii. Replace BCL often
 1. Patient handling considerations
 - a. Good = replacement by patient
 - b. Bad = monthly replacement in office
 - iii. Tint
 1. Photophobia
 - iv. Cosmesis
 1. Central clear pupil
 - v. Occlusion
 1. Diplopia
 - vi. Retainer for amniotic membranes
4. Drug delivery for allergic conjunctivitis
 - a. Antihistamine extended release
 - i. Reduced symptoms by half compared to control
- 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, roflucocon D, and roflucocon 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
 - 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
 - a. Monitor closely
5. Indications
 - a. Therapeutic treatment of OSD
 - i. Schornack et al
 1. Improved comfort and resolution of keratopathy
 2. Improved VA by >2 lines
 3. Undifferentiated OSD, Exposure, NK
 - ii. Romero-Rangel et al
 1. SJS, OCP, SLK, Exposure, Post Herpetic Keratitis, MGD
 2. 92% improved quality of life
 - iii. Asghari et al
 1. OSDI improved by 56%
 - b. PED treatment
 - i. Lim et al
 1. No preserved antibiotic prophylaxis in the reservoir

- ii. Cirasky et al
 - 1. Standardized approach
 - 2. 24hr wear
 - 3. Removal for disinfection
 - 4. Addition of non-preserved antibiotic (moxifloxacin)
- c. Decemetoele
 - i. Xu et al
 - 1. Temporization of descemetoele
 - ii. Gelles et al
 - 1. Resolution of descemetoele
- d. Neovascularization
 - i. Lim et al
 - 1. Addition of Bevacizumab improved NV
 - ii. Yin et al
 - 1. Effective in treating NV and improving vision with durable response and no complication.
- e. Opacity
 - i. Cressey A et al
 - 1. Neovascular regression
 - a. No adjunct topical treatment
 - ii. Cressey A et al
 - 1. 4 case retrospective
 - iii. Gelles et al
 - 1. Resolution of Lipid K based opacity
- f. Infections Keratitis
 - i. Polabia-Baron et al
 - 1. Antibiotic reservoirs
 - a. Resolution of 9 of 12
 - i. 3 failed - unresponsive to treatment
 - b. No complications or side effects were observed