Clinical Implications of Current Research on Scleral Lenses

1 Hour

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Course Description:
Practitioners have become very comfortable fitting scleral lenses. While the benefits of the lenses are known, there are many instances where answers are still being searched for, forcing researchers to play catch-up. This presentation is designed to discuss some of the changes that are understood regarding scleral lenses, some new thoughts based on recent findings, and what it means to practitioners fitting them.

Course Objectives:
The attendee will:

1. gain knowledge on the shape of the eye and how it relates to contact lens fitting
2. learn how the shape of the eye changes beneath a scleral lens
3. learn about the effects of fogging and IOP change beneath the scleral lens
4. gain knowledge about studies relating to clinical care and advice on when to be cautious with fitting scleral lenses
Course Outline:

I. Introduction
   a. Average practitioner understanding
      i. Advancing at a rapid pace

II. Ocular Shape & Clinical Success Factors
   a. Overview of eye shape
      i. Major role in successful fitting
         1. Tear exchange
         2. Alignment of optics
      ii. Also large factor in soft contact lenses
   b. Instrumentation allowing for first empirical fitting
      i. Placido-based corneal topography
         1. Extrapolated sagittal depth
      ii. Profilometry
         1. Fluorescein reflectance imaging allows for 3D image
            a. sMap3D
            b. Eaglet Eye
         2. Peer-reviewed studies relating to empirical fitting success
   c. Instrumentation for assessing fit
      i. Anterior segment OCT
         1. Can detect front and back and lens surface; allows for automated tear thickness calculations
         2. Assessment of tissue landing

III. Scleral Lens Clouding
   a. Life under the scleral lens
      i. What is really happening?
   b. Current thoughts on how to alleviate clouding
      i. Decreased central clearance
      ii. Limbal vaulting adjustment
      iii. Landing area changes, for good and bad

IV. Changes in Ocular Shape Under the Lens
   a. Where does the change in central clearance that occurs throughout the day come from?
      i. Amount of central vault decrease has been well documented through multiple studies
ii. What happens in the mid-periphery and limbal portions of the cornea?
   1. Conjunctival settling only a portion of total settling
   2. Current study involving corneal changes
      a. IRB-approved
      b. Results of OCT analysis
b. What is the corneal curvature under a lens?
   i. Spectacle blur after removing scleral lenses
   ii. Impacting shape of cornea intentionally
      1. Corneal reshaping
      2. Collagen cross-linking with ortho-k
c. What impact does this have on the shape of the anterior chamber?
   i. How could this clinically impact the use of scleral lenses?
   ii. Are certain types of patients more susceptible?

V. IOP Under a Lens
a. If corneal curvature and shape changes, does the anterior chamber pressure change as well?
   i. Attempts at measuring IOP underneath a scleral
b. Corneal swelling
   i. Oxygen permeability of lens materials
   ii. Dk of tears
   iii. Current models of Dk and scleral lenses
   iv. Effect of lens vault on corneal edema
      1. Recent studies: does amount of vault impact corneal edema?
      2. Results compared to theoretical models
c. Clinical considerations for practitioners before fitting scleral lenses
   i. Glaucoma patients
      1. Filtering blebs
   ii. Low endothelial cell counts
      1. Fuch’s
      2. Corneal transplant

VI. Studies & How Clinicians Can Use Them
a. High-order aberrations
   i. Decentering optics
b. Centration of lenses
   i. Quadrant-specific lenses
   ii. Clinical take-away for fitting patients

VII. Summary