Limbal stem cell deficiency in extended wear contact lenses

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Extended wear contact lenses are a great option for the properly selected patient. There are, however, still concerns for complications that include corneal hypoxia and increased incidence of infection, both of which can lead to limbal stem cell deficiency (LSCD).¹

A quick review of stem cells underscores their importance: Corneal epithelium, like other stratified squamous epithelium, is in a constant state of turnover.¹ Replacement of the sloughed epithelial cells begins with long-lived, slow-cycling, undifferentiated limbal stem cells located in the palisades of Vogt². The XYZ theory of corneal maintenance is depicted in Figure 1 with complete turnover expected every seven to 10 days².

This process can be altered by contact lens wear, multiple insults to the eye, severe microbial infection, chemical exposure, and radiation. In addition, intrinsic factors such as aniridia can be contributory. It is proposed that a combination of mechanical forces on the limbus and hypoxic factors is the culprit of LSCD in soft contact lens wearers. While LSCD can present in either a diffuse or focal form, the latter is more common in soft contact lens wearers with a preference for the superior cornea³. Conjunctivalization of the cornea, which abnormally stains with fluorescein, can be accompanied by superficial vascularization and epithelial defects upon examination. The patient may complain of a decrease in visual acuity, photophobia, pain, and tearing or may be asymptomatic¹.

In one study, soft contact lens-associated LSCD developed after an average duration of 17.6 years, with an average 12.5-hour-per-day wear frequency and with a higher prevalence in women. The same study found stabilization or resolution by simply discontinuing contact lens wear and lubricating the eye frequently in 61 percent of patients; 28 percent required topical steroids and 11 percent required surgical intervention.

Prognosis can be good for these patients especially if the diagnosis is made in the asymptomatic stage, emphasizing the need for annual contact lens exams.³

References

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