

Optical Coherence Tomography as a rapid, accurate, non-contact method of visualizing the Palisades of Vogt

Published date: Aug. 28, 2016

Technology description

Background

Stem cell deficiency is seen in many ocular diseases and can lead to blindness. The condition is associated with a wide variety of maladies including burns, contact lens wear, dry eye, topical medications, and ocular disease associated with immunologic disorders and can even be seen postoperatively. Until recently there was no good treatment, but advances in corneal and stem cell transplantation have restored sight to some patients.

Technology

Limbal epithelial stem cells are located in the Palisades of Vogt, a poorly understood structure in the limbus that provides the microenvironment necessary for survival and function of the stem cells. Considerable variability in the size, shape and specific location of the palisades complicates identification and harvesting of stem cells for transplantation. In addition, changes to the palisades take place in the normal course of aging as well as during disease conditions. While confocal microscopy can be used to identify the palisades, it requires direct contact with the eye, is time consuming and covers a very limited area with each scan. Optical Coherence Tomography offers the first opportunity for rapid, non-contact, three-dimensional in-vivo imaging of the Palisades of Vogt. Development of this technique will allow physicians to accurately harvest stem cells for transplantation, to monitor the palisades clinically for better diagnosis, follow-up and staging, and to identify patients at risk for stem cell deficit early in the disease process. This technique will also provide a valuable new tool for researchers investigating ocular disease and will allow the characterization of this ocular structure.

Application area

1. Identify patients at risk for stem cell deficit early in the disease process
2. Will also provide a valuable new tool for researchers investigating ocular disease and will allow the characterization of this ocular structure

Advantages

1. Optical Coherence Tomography offers the first opportunity for rapid, non-contact, three-dimensional in-vivo imaging of the Palisades of Vogt.
2. Development of this technique will allow physicians to accurately harvest stem cells for transplantation.
3. Monitor the palisades clinically for better diagnosis, follow-up and staging.

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