Identification of drusen characteristics in age-related macular degeneration

In this study, we investigated the morphologic characteristics of drusen in order to determine their composition, using an in-vivo technique, the optical coherence tomography (OCT). The development of drusen is an important characteristic of age-related macular degeneration (AMD), and the one that is clinically the most striking. During the course of early and intermediate AMD, drusen can grow as well as regress, and certain studies indicate that these morphologic changes might precede progression to late stages of AMD, which is characterized by a loss of visual function.

Studies using post-mortem eyes, in which the retina was sectioned and the drusen were isolated and investigated in order to unveil their content and microstructure, could find a wide variety in their composition – mostly metabolic waste-products of the retina, but also cells related to the immune system. These contents can characterize the drusen form and involve the surrounding structures in the retina as well, and these findings lead to the general assumption that some morphologic characteristics might have an influence on the progression of AMD. However, there is no possibility to draw conclusions on disease progression out of post-mortem eyes. Therefore, the goal of our study was to find and categorize characteristics of drusen using OCT. OCT is an in-vivo technology that produces a three-dimensional image with very high resolution of the retinal structures by scanning the eye with a light beam. We scanned eyes with early and intermediate AMD, segmented their drusen in the OCT images and categorized their structural characteristics.

The most common drusen type was a dome-shaped druse with a homogeneous composition – more than a half of all drusen were of this form. A third of the drusen showed internal inhomogeneousity, and in some rare cases, the retinal space around the druse was affected.

In accordance with outcomes of histologic studies, we think that drusen showing an inhomogeneous structure might indicate ongoing pathologic processes inside, which subsequently might lead to a regress of the druse and a progression of the disease, AMD. Further studies will investigate the morphologic characteristics of drusen in a follow up period – and might determine which characteristics are truly relevant for progression.

Ferdinand Schlanitz
Department of Ophthalmology and Optometry, Medical University of Vienna, Austria

Publication

Identification of Drusen Characteristics in Age-Related Macular Degeneration by Polarization-

Sensitive Optical Coherence Tomography.

Schlanitz FG, Sacu S, Baumann B, Bolz M, Platzer M, Pircher M, Hitzenberger CK, Schmidt-Erfurth U

Am J Ophthalmol. 2015 Aug