Abstract 150

AUTOMATED QUANTIFICATION OF UVEITIS KERATIC PRECIPITATES BY USE OF SD-OCT

Oral

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Purpose:

In the past 10 years a lot of effort has been put into objectivizing the grading of intraocular inflammation. To create an en face 3-D rendering of uveitis keratic precipitates (KPs) using anterior segment optical coherence tomography (AS-OCT) and correlate them to the SUN grading system.

Methods:

Patients with KPs were imaged at 3 time-points: with active uveitis (T0), when inflammation was clinically improving (T1) and after resolution (T2). A dense high resolution 20° x 10° volume of 81 b-scans focused on the endothelium of the cornea was used to obtain detailed features of the KPs. The cornea boundaries and precipitates were sequentially segmented in all the b-scans of the volume. Segmentation results were used to calculate the volume of precipitates per unit of analyzed area, and to reconstruct a map of precipitates. All image processing were performed using Matlab R2021b software with the Image Processing Toolbox.

Results:

A total of 1620 AS-OCT b scans from 20 eyes were analyzed. The mean volume of the KPs was 0.32 mm3 at T0, and significantly decreased to 0.25 mm3 at T1 and 0.06 mm3 at T2 (both $P < 0.0001$). The mean processing time of the software was 110 seconds for each dense volume of 81 scans. The volume of the KPs was significantly higher in granulomatous infectious uveitis ($P = 0.006$). KPs volume correlated with the clinical SUN grading with a significant increase at each grade of the anterior chamber cells count.

Conclusions:

In this study we developed an automated software that creates an en face rendering of uveitic KPs in less than 2 minutes using AS-OCT. KPs volume significantly correlates with the degree of anterior chamber inflammation, and decreases with inflammation resolution.