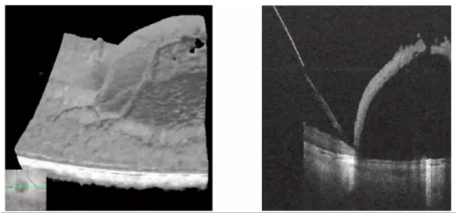
Making quantitative measurements of intraocular structures with optical coherence tomography

Unmet Need

Recent advancements in intraoperative optical coherence tomography (OCT) have significantly improved visualization of tool-tissue interactions inside the eye. Visually assisted procedures are becoming effective treatments for previously untreatable genetic or degenerative retinal diseases. While OCT-assisted procedures show great potential, they are limited in some ways by available viewing systems. Successful procedures require not only accurate visual information about tool-tissue placement, but also precise and accurate measurements of intraocular structures. One approach for OCT-assisted procedures is an indirect retinal viewing system. However, indirect systems are also known to introduce distortions into the resulting OCT images, and using these types of OCT images as a basis for measurement in computer modeling is limited due to inaccuracies. Thus, there is an ongoing need for improved methods to accurately and quantitatively measure intraocular volumes in indirect viewing systems.

Technology

Duke inventors have developed a technique for making quantitative measurements using intraoperative OCT. The technique is intended to create an accurate optical model of the patient’s eye that allows the clinician to extract additional data, such as accurate volumes and positions of elements in the captured images. This includes elements like the subretinal blebs formed when administering a therapeutic agent. Specifically, the inventors have reported a calibrated optical model that allows for quantitative measurements and dewarping of OCT scans. This technology was



demonstrated to accurately estimate bleb volumes in porcine eyes.

Advantages

- Enables accurate visual information about tool-tissue placement and intraocular structures
- Offers ability to quantify volume of therapeutic delivered, which could improve the highly variable qualitative visual estimation that surgeons currently use to assess delivery success
- Demonstrated accuracy by estimating an intended 50 µL injection to 46.9 ± 4.37 µL

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Publication(s)

External Link(s)

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