**Microscope-integrated OCT-guided volumetric measurements of subretinal blebs created by a suprachoroidal approach**

Ananth Sastry, MD
Durham, NC

Jianwei D Li, BS, William Raynor, BS, Christian Viehland, PhD, Zhenxi Song, Liangyu Xu, BS, MS, Sina Farsiu, PhD, Joseph Izatt, PhD, Cynthia Toth, M.D., Lejla Vajzovic, MD

**Purpose:**
This study aims to advance the use of imaging modalities to measure the volume of medications delivered into the subretinal space. It specifically examines the volume of subretinal blebs created by a novel subretinal drug delivery device utilizing microscope-integrated optical coherence tomography (MIOCT).

**Methods:**
An MIOCT image-based volume measurement method was developed and assessed for accuracy and reproducibility by imaging ceramic spheres of known size that were surgically implanted into ex-vivo porcine eyes. This method was then used to measure subretinal blebs created in 10 porcine eyes by injection of balanced salt solution utilizing a novel subretinal delivery device via a suprachoroidal cannula (Gyroscope Therapeutics, London, UK). Bleb volumes obtained from MIOCT were compared to the intended injection volume.

**Results:**
Validation of the image-based volume measurements of the ceramic spheres showed accuracy to +/- 0.029 μL (5.6%) for objects imaged over the posterior pole and +/- 0.025 μL (4.8%) over the peripheral retina. The mean expected injection volume from extraocular tests of the suprachoroidal cannula was 66.44 μL (σ = 2.4 μL). The mean injection volume as measured by the MIOCT imaging method was 54.8 μL (σ = 12.3 μL), or 82.48% of expected injection volume.

**Conclusions:**
MIOCT can be used to measure the volume of subretinal blebs with accuracy and precision. It provides a method for visualization, and analysis of the images enables surgeons to quantify and evaluate the success of subretinal drug delivery. The novel suprachoroidal approach using the Orbit Subretinal Delivery System was able to deliver greater than 80% of expected injection volume into the subretinal space, as assessed by MIOCT.