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Structure/Function Relationship in Experimental Primate Glaucoma

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Introduction
The glaucomas are a group of diseases that can lead to irreversible blindness, if left untreated. The decrease in visual function from glaucoma is related to the irreversible loss of retinal ganglion cells (RGCs). These losses of RGCs are clinically observed as thinning of the optic nerve head (ONH) neural retinal rim (NRR) tissue, loss of retinal nerve fiber layer (RNFL), and a loss of visual sensitivity. This purpose of this presentation is to present work on structure-function relationships developed in the non-human primate (NHP) glaucoma model.

Structural measures
Structure, as it pertains to glaucoma, is most commonly evaluated using ophthalmoscopy in the clinical setting. With advances in imaging technologies, high resolution, objective, and repeatable measures of the posterior segment are obtained with optical coherence tomography. Morphological measures from OCT are influenced by ocular magnification characteristics of the eye. Hence, scaling scans results in less variability and improved accuracy. In the NHP glaucoma model, a decrease in the ONH NRR precedes RNFL thickness and macula RGC/inner plexiform layer thickness (GCIPL).

Functional measures
Both structural and functional data are essential for diagnosis, detection of disease progression, determining rate of loss and staging of disease. With a loss of RGCs, there has to be an associated loss of visual function. In the clinical setting, visual function is commonly quantified using 30-2, 24-2, and 10-2 white-on-white standard automated perimetry. The relationship between OCT derived ONH NRR, RNFL and macula GCIPL will be discussed during this presentation.