Reliability of Optical Coherence Tomography (OCT) & Correlation of OCT Results with Visual Field Damage in High Myopic Glaucomatous Patients

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INTRODUCTION

- Glaucoma is an optic neuropathy characterized by progressive optic disc and visual field (VF) defects. These defects are suspected to result from damage to retinal ganglion cells and their axons, specifically known as the retinal nerve fiber layer (RNFL).
- With the advent of optical coherence tomography (OCT), RNFL damage can be objectively measured in patients.

Many OCT studies exclude patients with glaucoma or high myopia, but it is important to be able to reliably evaluate structural and functional changes in patients who suffer concomitantly from high myopia and glaucoma.

PURPOSE

- The objectives of this retrospective cross-sectional study were to:
  1) evaluate the reliability of OCT results in high myopic glaucoma patients
  2) investigate the relationship between structural and functional status of these patients using OCT and VF results

METHODS

- Clinical Data Acquisition
  - IRB approval was obtained for this study. Patients were reviewed based on their myopic status (spherical equivalent < -5.0D in >1 eye) and diagnosis of glaucoma.
  - OCT Data Acquisition
    - RNFL thickness values for the overall average; for the temporal, superior, inferior, and nasal quadrants; and for each of 12 clock-hour sectors.
  - VF Data Acquisition
    - VF mean deviation (MD), pattern standard deviation (PSD), and reliability indices (fixation loss, false positives, false negatives).

RESULTS

- Baseline Characteristics [Table 1]
  - Total: 116 eyes from 78 glaucoma patients with high myopia
    - OCT available in 44 eyes (38%)
    - OCT unreliable in 3 of 44 eyes (7%)
  - Group with reliable OCT was significantly less myopic (less negative SE) than group with unavailable or unreliable OCT (p=0.045)

- Principal Findings [Figure 4(a)-(c)]

DISCUSSION & CONCLUSION

- Greater global VF damage (more negative MD) was associated with thinner clock-hour 4, clock-hour 10, & superior quadrant RNFLs (p<0.02).
- Superior and inferior quadrant RNFL thicknesses have previously been found to be significantly thinned in high myopia and glaucoma
  - Small sample size and observing global rather than quadrant VF damage may have contributed to lack of findings in inferior quadrant
  - Thinner superior quadrant RNFL thicknesses are associated with higher myopia and global VF damage in high myopic glaucomatous patients

REFERENCES: