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Vessel density and structural measurements of optical coherence tomography in primary angle closure and primary angle closure glaucoma

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**ABSTRACT:**

**Purpose:** To evaluate the vessel density measurements of the optic nerve head (ONH), peripapillary and macular regions on optical coherence tomography (OCT) angiography in eyes with primary angle closure (PAC) and primary angle closure glaucoma (PACG), and to compare their diagnostic abilities with the ONH rim area, peripapillary retinal nerve fiber layer (RNFL) thickness and the macular ganglion cell complex (GCC) thickness measurements on OCT in PACG.

**Design:** Cross-sectional study

**Methods:** Seventy-seven eyes of 50 control subjects, 65 eyes of 45 patients with PACG, and 31 eyes of 22 PAC patients with a history of high IOP, underwent imaging with OCT. Area under receiver operating characteristic curves (AUC) and sensitivities at fixed specificities of vessel densities were compared with structural measurements.

**Results:** All the vessel density and structural measurements were significantly lower ( $p < 0.05$ ) in the PACG compared to the control group. Vessel densities in the PAC were similar ( $p > 0.05$ ) to that of the controls; the superotemporal RNFL, however, was significantly thinner in the PAC group ( $127 \mu\text{m}$  vs.  $135 \mu\text{m}$ ,  $p = 0.01$ ). The AUC and sensitivity at 95% specificity of vessel densities within the ONH (0.76 & 42%) and macular region (0.69 & 18%) in PACG were significantly lower ( $p < 0.001$ ) than ONH rim area (0.90 & 77%) and GCC thickness (0.91 & 55%) respectively. AUC and sensitivity of peripapillary vessel density (0.85 & 53%) were similar ( $p = 0.25$ ) to RNFL thickness (0.91 & 65%).

**Conclusions:** These results suggest that structural changes in PACG occur earlier than the reduction in retinal vessel densities.

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