Swept-Source OCT-Angiography of the Anomalous Foveal Avascular Zone

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Purpose
To analyze anomalous appearing (vascularized) foveal avascular zones (FAZ) using swept-source OCT-angiography (SS-OCTA) and compare these findings to the contour of the corresponding foveal pit using swept-source OCT (SS-OCT).

Study Design
Cross-sectional retrospective case series.

Methods
14 eyes with anomalous (vascularized) FAZs from 10 patients were identified using swept-source OCT-A (Topcon Triton; Tokyo Japan). Patient medical records were reviewed to obtain demographic, visual acuity, and ophthalmological diagnosis information. Swept-source OCT imaging was used to characterize the foveal contour and identify the presence of fovea plana (FP). Each of the vascular layers in the retina (superficial capillary plexus, deep capillary plexus and choriocapillaris) were evaluated for both affected and unaffected eyes using the 3.0mm x 3.0mm strategy. Depth-decoded images were examined to identify anastomosis between the superficial and deep capillary plexus in all eyes.

Results
8 out of 13 patients had an anomalous FAZ findings in only one eye, while the remaining 5 patients had bilaterally anomalous FAZ presentations. The FAZ was absent in all 17 eyes at the level of the superficial capillary plexus (SCP). Five eyes demonstrated complete vascularization of the FAZ at the levels of the deep capillary plexus (DCP) in addition to the SCP. The choriocapillaris was normal in all eyes. 9 eyes with a vascularized FAZ demonstrated a foveal plana configuration on SS-OCT, while 8 eyes had a normally developed pit. 5 of 13 patients had anomalous FAZ presentations bilaterally, and 2 patients with single eye involvement had a partial FAZ in their uninvolved eye. Mean ETDRS BCVA was 0.19 ± 0.15 logMAR units for anomalous FAZ eyes, and 0.17 ± 0.16 logMAR units for uninvolved eyes for patients with single eye involvement.

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Conclusions

The foveal avascular zone (FAZ) is a key anatomical landmark which can be imaged successfully using swept-source OCT-angiography. Vascularization of the FAZ is uncommon and can be found in eyes with both a normally developed FAZ as well as eyes with a fovea plana configuration and is not necessarily associated with worse vision. The superficial capillary plexus and deep capillary plexus can both be involved in an anomalous vascularized FAZ configuration.