Editorial

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The Highlights from Experiences on Enhanced Depth Imaging-Optical Coherence Tomography

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Editorial

The choroid is a highly pigmented and vascularized ocular tissue providing the vascular supply of the outer retinal layers. It may be affected by various retinal and choroidal diseases such as age-related macular degeneration (AMD), polypoidal choroidal vasculopathy (PCV), central serous chorioretinopathy (CSCR), age-related choroidal atrophy (ARCA), high/pathologic myopia, choroidal melanoma, and some vascular and inflammatory diseases of the choroid [1-6]. Thus, to evaluate the choroidal vasculature and thickness and also the choroidoscleral junction (CSJ) may provide important acquisitions concerning the pathogenesis and diagnosis of many chorioretinal diseases. Enhanced depth imaging optical coherence tomography (EDI-OCT) is a modified imaging technique which spectral-domain OCT device was placed close to the eye and so which the inverted image and increased depth obtained from this imaging mode provide better visualization of the choroid and CSJ. In the light of recent studies, we can state some highlights concerning choroidal thickness (ChT) and imaging with EDI-OCT:

- ChT is highest in the fovea (ranging between 260 and 354 µm), and choroid is thinner in all other regions out of macula, especially nasally. The surrounding superior and inferior choroidal quadrants within the macular region are generally thicker than the nasal and temporal quadrants. Additionally, the superior choroid is usually thicker than the inferior choroid [7-15].
- ChT diminishes with aging by about 15 µm with every decade of life. In patients older than about 60, ChT progressively decreases by 4 µm to 5 µm each year and the mean subfoveal ChT in individuals over 60 years old is about 197 µm. However, it has been reported that age has little effect on ChT in younger patients [8,12-16].
- There are negative correlations between ChT and degree of myopia, and ChT and degree of axial length. It has been reported that subfoveal ChT is expected to decrease by approximately 15 µm/per diopter of myopia and 32 µm/each 1 mm increase in axial length in eyes with myopia of greater than 1.00D [7,8,12,16-19].
- ChT of healthy adult males is a greater than adult females. However, choroid in female children is thicker than that in male children according to the results from the Copenhagen Child Cohort 2000 Eye Study and other studies [12,19,20].
- ChT has significant diurnal variation (with diurnal amplitude 20-30 µm) in normal subjects because the choroid is not autoregulated tissue and choroidal blood flow has fluctuation. It is generally thicker in the morning (between 3 a.m. and 9 a.m.) and the thinnest in the evening (between 3 p.m. and 9 p.m.). The fluctuation in ChT is correlated with age, axial length, refractive error, and alterations in systolic blood pressure [21-23].
- Subfoveal ChT in children ranges between 312 and 349 µm, and it is correlated with age and negatively correlated with axial length [24-30].
- ChT in healthy pregnant women is greater than in normal non-pregnant women. Choroidal thickening in pregnants occurs at the regions subfoveal, temporal, and nasal to the fovea in the second trimester [31-35].
- Peripapillary ChT is the lowest in the inferonasal region. The thickness of the lamina cribrosa was found to be thinner in eyes with primary open angle glaucoma and normal tension glaucoma compared with normal eyes [1-6,36-37].
- Diminishing of ChT occurs in advanced nonexudative AMD, ARCA, high myopic chorioretinal atrophy, idiopathic macular hole and normal tension glaucoma (NTG), type 2 diabetes (diabetic retinopathy and macular edema) and retinitis pigmentosa [38-45].
- Choroidal thickening is usually observed in CSCR, Vogt-Koyanagi- Harada disease, PCV, pachychoroid pigment epitheliopathy (PPE), Pachychoroid neovasculopathy (PNV), adult onset foveomacular vitelliform dystrophy (AOFVD) [38, 46-60].
- In EDI-OCT, a hyporeflective space consistent with vascular channels reflects a choroidal hemangioma while as choroidal nevus or melanoma has a homogeneous structure. Gray-scale EDI-OCT can show overlying choriocapillaris thinning, RPE atrophy, deep posterior choroidal shadowing in the small choroidal nevus [61-65].

In the other hand, EDI-OCT of a choroidal melanoma can demonstrate photoreceptor and RPE atrophy, increased tumor thickness, intraretinal/subretinal fluid accumulation, subretinal lipofuscin deposition, disruption in the external limiting membrane and the ellipsoid zone, irregularity in the layers including the inner plexiform and the ganglion cell. Additionally, in choroidal metastatic tumors, the differential findings from other pathologies in EDI-OCT are a plateau-shaped tumor with low internal reflectivity, ''shaggy photoreceptors'', and subretinal fluid with high-reflective speckles [61-65].

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