

What swept-source OCT tells us about the pathogenesis of pathologic myopia and its complications

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Pathologic myopia (PM) is the major cause of visual impairment in East Asian countries. It is characterized by a presence of eye deformity represented by posterior staphyloma. However, it is still unclear why and how staphyloma occurs.

Sometimes other pathologies could give us an important clue. Dome-shaped macula (DSM) is an inward bulge of the macula due to a local thickening of macular sclera. In our high myopia clinic, we have experienced that patients with patchy atrophy around the macula often developed DSM. Patchy atrophy was recently shown to represent Bruch's membrane (BM) hole. In thorough investigation of the eyes with DSM by using swept-source OCT, a significant association between DSM and surrounding BM defects was shown. Thus, DSM was like an emerging island with intact BM surrounded by the area without DSM. It is true that DSM may have various subtypes, however, this data suggested the possibility that BM status may affect the scleral curvature especially in the eyes with extremely thin choroid in between. The detailed observation of sclera in the area of DSM also shows how scleral fibers are assembled according to a formation of DSM. These findings obtained in eyes with DSM can also be applied for the pathogenesis of posterior staphyloma in general.

The prevalence of myopia has been increasing worldwide. However, it is still unclear whether or not an increase of school myopia leads to an increase of blindness due to PM. In other words, does school myopia develop posterior staphyloma when the myopic refraction becomes severe? To partly answer this question, we retrospectively analyzed fundus photos in childhood for the adult patients with PM. The results showed that most patients already had specific fundus lesions in childhood, which was parapapillary diffuse chorioretinal atrophy. Swept-source OCT showed that this started from segmental and complete loss of choroid only in the parapapillary region.

Based on the above findings, our hypothesis on how PM and staphyloma develops will be presented.