Focal Choroidal Excavation Development Associated with Drusenoid Pigment Epithelial Detachment: A Case Report

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Dear Editor,

Focal choroidal excavation (FCE), is a focal concavity within the choroid discernible through optical coherence tomography (OCT), without scleral changes. De novo development of FCE has rarely been reported, and its occurrence within the context of drusenoid retinal pigment epithelial detachment (DPED) accompanied by pachychoroid status has not yet been reported. In this report, we present the first case of de novo FCE development in a patient with DPED and pachychoroid. Written informed consent for publication of clinical images was obtained from the patient.

A 80-year-old previously-healthy Korean woman presented with decreased visual acuity in her right eye with unknown onset. The best-corrected visual acuity (BCVA) was 20/40 in the right eye. Fundus examination revealed subfoveal yellowish lesion with distinct borders (Fig. 1A). OCT showed RPED with homogenous and mildly hyper-reflective interior (Fig. 1B). Choroidal thickening was observed in both eyes. Late phase fluorescein angiography demonstrated stippled hyperfluorescence and indocyanine green angiography revealed the hypofluorescent area in the fovea (Fig. 1C and 1D). Choroidal neovascularization (CNV) was not detected.

After four months, the foveal lesion expanded with indistinct borders (Fig. 1E). On OCT, the height and width of the separation between the retinal pigment epithelium (RPE) and Bruch’s membrane (BM) increased, representing DPED (Fig. 1F). Seven months after the first visit, the DPED began to regress spontaneously (Fig. 1G), and one year three months after the first visit, only shallow pigment epithelial detachment remained without fluid accumulation (Fig. 1H). Hyper-reflective lesion was observed in the choriocapillaris and Sattler’s layer under the fovea. One year nine months after the first visit, conforming type of FCE with intact external limiting membrane and focal ellipsoid zone disruption was observed in the fovea (Fig. 1I). BCVA was 20/40 and the patient underwent cataract surgery. Three years nine months after the first visit, the FCE deepened (Fig. 1J), and visual acuity was 20/20, but she complained of metamorphopsia. The yellowish lesion in the fovea disappeared, leaving pigmentation (Fig. 1K), and OCT angiography en face scans segmented below the RPE-BM complex showed circular vascular network surrounding FCE (Fig. 1L).

Two case reports have described the clinical course of the FCE development in multiple evanescent white dot syndrome.(1, 2) The authors proposed two potential mechanisms of FCE development: 1) inflammation between the outer retina and the inner choroid, leading to RPE and BM damage, and 2) imbalance between intraocular and choroidal pressure. Additionally, Wiryasaputra et al. reported the development of FCE after treating CNV.(3) The authors hypothesized that focal damage to the RPE and BM resulting from prior CNV and pachychoroid condition might be linked to the FCE development. Similarly, we hypothesized that focal RPE and BM damage secondary
to DPED regression could exceed the threshold of elasticity of RPE-BM complex, causing localized vulnerability. In this case, the RPE-BM complex was collapsed like a sinkhole rather than being pushed by the vitreous pressure, considering minimal change in the contour of the inner retinal layer and chorioscleral interface. Ellabban et al. speculated that a hyper-reflective choroidal tissue under the excavation on OCT may represent focal scarring of the choroidal connective tissue and following contraction leads to the formation of the excavation.(4) Our case also showed an increase in the number of hyper-reflective lesions beneath the excavation on OCT, with the subfoveal choroidal thickness decrease over time as the FCE deepened. Therefore, we hypothesized that both focal vulnerability of the RPE-BM complex and focal choroidal lesion may have played a role in the development of FCE. CNV associated with FCE has been documented along the slope or within the RPE.(5). In our case, circular non-exudative CNV starting from the temporal side of the FCE and encircling the FCE was detected on OCT angiography. As both DPED and FCE have been reported as individual risk factors for CNV, we hypothesized that the likelihood of CNV development increases when DPED and FCE coexist. Further research is necessary to determine whether FCE and DPED have a synergistic effect on CNV development.

Taken together, we report the first case showing progression from DPED with pachychoroid to acquired FCE development, suggesting that damage to RPE-BM complex and underlying choroidal tissue may play a pivotal role in the pathogenesis of FCE development.

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None

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References


Figure Legends

Figure 1. Multimodal imaging of the right eye at presentation and follow-up. (A) Fundus photograph shows a distinct, well-defined, yellowish subretinal lesion at the fovea. (B) Initial OCT scan depicting retinal pigment epithelial detachment (PED) and pachychoroid features characterized by pachyvessels and choroidal thickening. (C) Late-phase fluorescein angiography highlighting areas of stippled hyperfluorescence, and corresponding hypofluorescence on indocyanine green angiography. (D) Choroidal neovascularization is absent. (E) Four months after the first visit, follow-up fundus photograph illustrates a notable enlargement of the foveal lesion. (F) OCT image demonstrates an enlargement of the PED. (G) Seven months after the first visit, spontaneous regression of detached PED is evident. (H) One year and three months after the first visit, a residual shallow PED remains, along with hyperreflective lesions (yellow arrowheads) beneath the fovea. (I) One year and nine months after the first visit, conforming-type focal choroidal excavation developed, accompanied by focal disruption of the ellipsoidal zone (yellow arrow) within the same region. (J) Three years and nine months after the first visit, OCT scan shows progressive deepening of the choroidal excavation. (K) Fundus photograph shows resolution of the foveal lesion leaving pigmentation. (L) En face OCT angiography scan through the choroid reveals a circular vascular network surrounding the area of focal excavation.