LETTER TO THE EDITOR

En face optical coherence tomography visualization of post-traumatic photoreceptor disruption

Visualisation de l’interruption post-traumaitique des photorécepteurs avec « en face optical coherence tomography »

Introduction

Macular injuries after head or eye contusion can consist in a variety of visible lesions, including retinal or vitreous haemorrhages, macular hole, macular edema, retinal pigment epithelium (RPE) rip, choroidal neovascularization, macular atrophy and commotion retinæ [1]. In commotion retinæ, optical coherence tomography (OCT) examination has shown typical outer retinal changes corresponding to photoreceptor damage [2–6]. Nevertheless, sometimes, the presence and extension of subtle retinal lesions after head or eye contusion might not be evident on fundus examination, fluorescein angiography, and even conventional OCT scans [7]. We describe a case of focal disruption of the photoreceptor inner segment/outer segment (IS/OS) junction after head contusion, whose presence and extension was clearly visualized by en face spectral-domain (SD)-OCT, in the absence of fundoscopically detectable changes.

Case report

A 48-year-old woman was referred to our department complaining of persistent central metamorphopsia in her left eye, after a severe head and cervical injury. Her ocular and medical history was unremarkable. At presentation, best-corrected visual acuity (BCVA) was 20/20 in both eyes. Slit-lamp anterior segment examination, intraocular pressure and fundus biomicroscopy were normal in both eyes. The patient had already performed elsewhere several ophthalmological exams, including a fluorescein angiography and OCT reportedly unremarkable in both eyes. Neurological and neuro-ophthalmological assessments were negative. Particularly, no afferent pupillary defect was detected, optic disk appeared normal, and brain and orbital MRI was negative. Central visual field, electroretinogram and visual evoked potentials were normal and did not yield any conclusive finding.

We performed SD-OCT (Spectralis SD-OCT; Heidelberg Engineering, Heidelberg, Germany) examination, with very close scans centered onto the fovea and en face enhanced depth imaging (EDI) scan modality, which revealed a focal disruption line of the IS-OS junction in the foveal region. The patient also performed a microperimetry, which revealed only one focal point of reduced sensibility within the fovea and a multifocal ERG that was normal. Four months later, symptoms of metamorphopsia were still present and visual acuity was unchanged. SD-OCT with follow-up examination highlighted the persistence of the small focal photoreceptor disruption (Fig. 1).

Discussion

Macular lesions after head contusion may frequently occur because the highest shearing forces in the retina are situated along the posterior vitreous base [8]. Histological studies have shown changes in the outer retinal structure after a blunt trauma [9,10], which may correspond to the increased reflectivity in the IS/OS junction recently described in vivo using OCT [2–6]. These changes are generally associated with a typical transient retinal whitening appearance (commotion retinæ) on fundus examination [5,6]. OCT suggests that macular lesions may be reversible as soon as 1 week after head contusion [2–6], probably due to a partial regeneration of the outer segments [5].

In our patient, retinal and macular morphology appeared unremarkable on fundus examination, and a photoreceptor alteration was shown only after a precise analysis of the outer retina by SD-OCT. We did not find a hyper-reflectivity in the IS/OS junction, but rather a focal disruption of the photoreceptor layer in the foveal area. This was probably due to a later post-acute examination in our patient, which did not allow detecting the hyper-reflectivity in the IS/OS junction, typically seen in the early post-traumatic phases. In our patient, the focal disruption in the IS/OS junction and the symptoms did not improve over time, suggesting irreversible photoreceptor changes as result of head contusion.

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Recently, a subclinical photoreceptor disruption was noted with adaptive optics imaging system, in absence of clinically detectable changes on both fundus examination and SD-OCT [7]. The authors disclosed a focal area of photoreceptor disruption with adaptive optics examination and concluded that SD-OCT resolution is likely not sensitive enough to reveal post-traumatic photoreceptor changes. In our case, photoreceptor disruption was very subtle; it was discovered after multiple and very close scans centered to the fovea and with the en face EDI scan modality. The en face modality provides a comprehensive visualization of macular lesions, while a single OCT scan sometimes might be not sensible enough to detect subtle photoreceptor changes.

In conclusion, focal and irreversible disruption of the photoreceptor layer may occur after head contusion. SD-OCT, especially with the en face EDI scan modality, is a useful tool in the diagnosis of visual loss related to post-traumatic photoreceptor changes.

Disclosure of interest

The authors declare that they have no conflict of interest concerning this article.

References


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