

A Case of Visual Loss in Macular Atrophy after Commotio Retinae

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Abstract

We report a case of visual loss due to macular atrophy after Berlin's edema. A 58-year-old male visited our clinic after ocular trauma by rope. On presentation, uncorrected visual acuity was 0.63 / finger count 20 cm, and intraocular pressure was 19 / 15 mmHg by tonopen (right / left eye). Fundus examination of right eye showed widespread commotio retinae involving macula and fundus of left eye was invisible due to gross hyphema. Gonioscopic findings of left eye showed angle recession of 360 degrees. After regression of hyphema, fundus of left eye also showed widespread commotio retinae involving macula. The patient complained about central visual field loss, and visual field test showed central visual field defect. Visual evoked potential and multifocal electroretinogram showed decreased retinal function in left eye, and optical coherence tomography (OCT) showed significant decreased macular thickness. 1 month after trauma, uncorrected visual acuity was increased to 0.1, but after then the patient showed permanent visual loss with macular atrophy.

Key words : Berlin's edema, Macula atrophy, Ocular trauma, Visual acuity

Introduction

Commotio retina usually occur after ocular blunt trauma. It may be localized to macular region or involved to peripheral retina. It may accompany with retinal, subretinal, preretinal hemorrhage, and choroidal rupture and so on. If not involve the fovea, the visual acuity is good. The course of it is temporary and benign. But we experienced a macular atrophy after commotion retinae and delayed visual loss, so report it with literature review.

Reports of a Case

A 58-year-old male was referred to our clinic due to ocular blunt injuries. He had ocular trauma history due to ship's loss accident. At his first visit, uncorrected visual

acuity was 0.63 / finger count 20 cm, and intraocular pressure was 19 / 15 mmHg by tonopen (right / left eye). Direct and indirect light reflex of both eyes was intact, and orbital CT showed medial orbital wall fracture in left eye, and there was limitation of ocular movement. Anterior examinations showed gross hyphema in left eye and fundus examination of right eye showed widespread commotion retinae involving macula and fundus of left eye was invisible due to gross hyphema.(Fig. 1A) Gonioscopy of left eye showed angle recession of 360 degree. After regression of hyphema, fundus of left eye also showed widespread commotion retinae involving macula.(Fig. 1B) The patient complained about central visual field loss, and visual field showed central visual field defect.(Fig. 2. A, B.) Visual evoked potential and multifocal electroretinogram showed decreased retinal function in left eye, and optical coherence tomography (OCT) showed significant decreased macular thickness.(Fig. 3, 4.) 1 month after trauma, uncorrected visual acuity was increased to 0.1, but after then the

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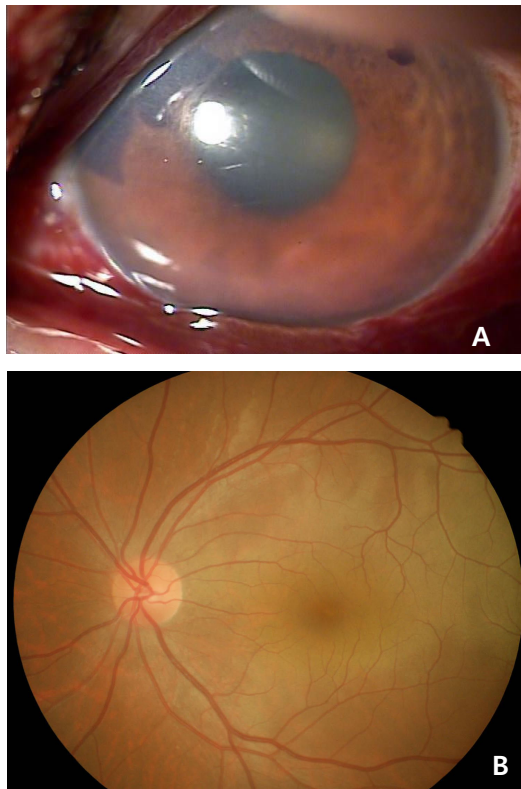


Fig. 1. Initial ophthalmic findings. (A): Initial anterior examination. Gross hyphema and subconjunctival hemorrhage due to trauma was shown. (B): After resolving hyphema, fundus of left eye showed widespread commotion retinae involving macula.

patient showed permanent visual loss with macular atrophy.

Discussion

First in 1973, commotio retinae or Berlin's edema was described by Berlin.¹⁾ It is characterized by temporary gray-whitish patch like discoloration or opacification at the level of the outer neurosensory retina and it usually occurs in blunt ocular traumatic injury. This lesion may be localized to posterior pole or involve more widespread peripheral retina. Retinal, preretinal, subretinal hemorrhage and macular hole may occur associated with it.²⁻⁴⁾ Visual acuity can range from normal, if the injury is confined to the periphery,

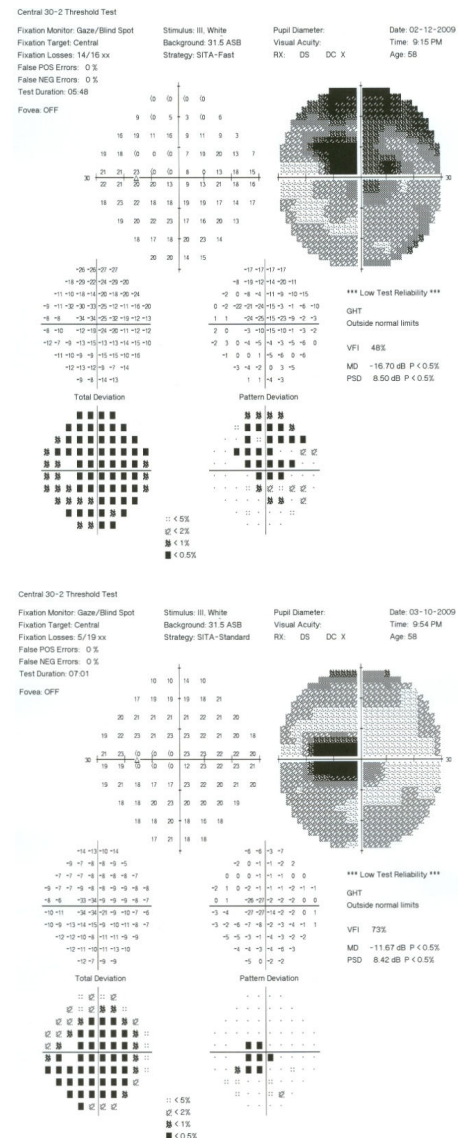


Fig. 2. Humphreys visual field test. (A): Initial test after trauma showed diffuse central visual defect. (B): After resolution of commotio retinae, visual field showed a permanent central field defect in left eye.

to loss of central vision, if macular involvement is present.

It may be typically occur after blunt anterior segment injury, and opposite site of impacted site. A countercoup mechanism is important factor in this lesion.

The pathogenesis of it has been extensively studied. Berlin was first reported that extracellular edema is the cause of outer neurosensory retinal discoloration.

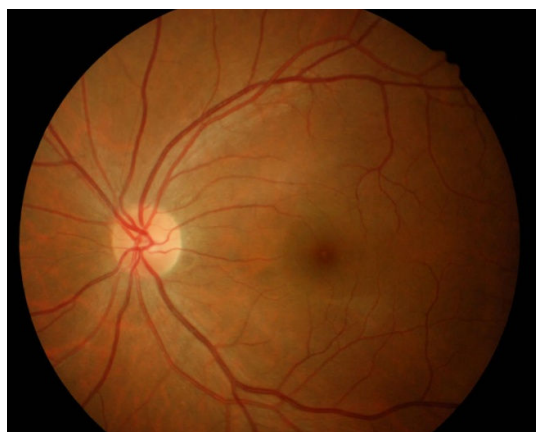


Fig. 3. After resolution of commotio retinae, whitish edema of retina has disappeared.

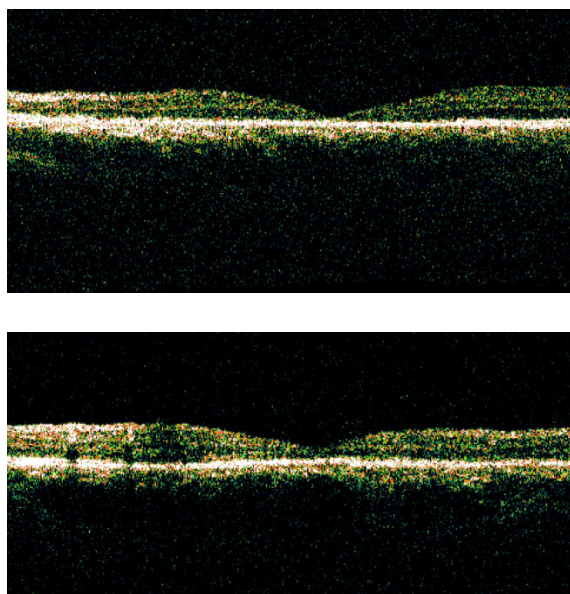
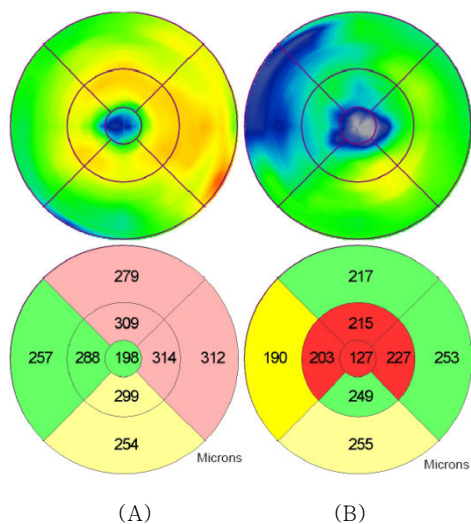


Fig. 4. On OCT, central macular thickness in left eye(B) was 127 μ m, compared to right(A), 198 μ m.

There is other reports about fluid-filled space in the outer retina, or intracellular edema.^{5,6)} Sipperley et al. had reported about disruption of photoreceptor outer segments, followed by phagocytosis of outer segments reached as far as the ganglion cell and inner plexiform layers.⁷⁾ Associated findings are retinal pigment epithelial hyperplasia and disorganized Bruch's membrane and atrophy of overlying outer segments. In patients with commotion retina, visual loss may be transient or permanent according to RPE changes and pigment migration.⁸⁾ Although these ophthalmic findings may be resolve after resolution, hyperplasia and migration of retinal pigment epithelial cells or macular hole may occur. There is no proven proper treatment for permanent decreased cases.

In our case, permanent visual loss is induced by macular atrophy after commotion retinae. This is unlike that it may usually show recovery of visual acuity after transient decline of visual acuity. Though the visual acuity take a turn for better after commotio retinae, we should consider the possibility of delayed visual loss due to macular atrophy.

Conclusion

Commotio retina is a common finding after ocular blunt trauma and it may accompany with many other complications. But course of it is temporary and prognosis is usually good. But after severe trauma, commotio retinae may accompany with macular atrophy, and visual loss. So close and careful follow-up should be required.

국문초록

망막진탕 후 발생한 황반위축으로 시력저하가 발생한 증례를 보고하는 바이다. 58세 남성이 안외상 후 본원을 내원하였다. 당시 나안시력 우안 0.63, 좌안 안전수지

20cm, 안압 19 / 18 mmHg로 측정되었으며, 안저검사상 우안의 황반부를 포함한 대부분의 안저에 망막진탕 소견이 보였으며, 좌안은 전방출혈로 인해 안저소견 확인이 불가능하였다. 전방각경 검사에서 360도 전방각 후퇴 소견이 보였다. 좌안 전방출혈의 호전 후 황반부를 포함한 광범위한 망막진탕 소견을 확인할 수 있었으며, 환자는 좌안 중심시야의 장애를 호소하였다. 좌안 시야 검사상 중심부 시야 결손 소견이 나타났으며, 시유발 전위검사 및 다초점국소망막전위도 검사에서 좌안 망막 기능저하 소견을 확인할 수 있었고, 빛간섭단층촬영을 통해 황반부 두께의 유의한 증가를 확인하였다. 외상 1개월 후 좌안 나안시력은 0.1로 향상되었으나, 이후 좌안 황반위축과 함께 영구적 시력저하를 보였다.

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