

Posttraumatic acute choroidopathy

Özlem Dikmetas · Annegret Abaza · Faik Gelisken

Received: 13 August 2017 / Accepted: 11 December 2017 / Published online: 19 December 2017
© Springer Science+Business Media B.V., part of Springer Nature 2017

Abstract

Purpose To report a case of acute choroidopathy following a blunt ocular trauma.

Methods Ocular examination included dilated fundus examination and optical coherence tomography enhanced depth imaging (OCT-EDI).

Patients Single-patient case report.

Case report A 10-year-old boy was referred following a blunt trauma to the right eye. The visual acuity diminished to 20/200 and mild hemorrhage was found in the anterior chamber. The fundoscopy was unremarkable. An OCT-EDI revealed a choroidal thickening and detachment at the macula. Six month later, the choroidal morphology resolved and the visual acuity improved.

Conclusions This study reported a case of acute choroidopathy associated with temporary thickening of the choroid and separation of the Haller's layer from the sclera. OCT-EDI helped to detect and monitor the

morphological changes in the apparently normal-looking macular choroid after ocular trauma. Further case reports with long term follow-up are needed to clarify the clinical impact of posttraumatic acute choroidopathy.

Keywords Blunt ocular trauma · Choroid · Edema · Enhanced depth imaging · Optical coherence tomography

Blunt ocular trauma may cause a variety of complications in the posterior segment, such as Berlin edema, retinal and choroidal hemorrhage, choroidal rupture, Bruch's membrane rupture, and macular hole or optic nerve avulsion [1].

Optical coherence tomography enhanced depth imaging (OCT-EDI) is a noninvasive diagnostic tool, allowing better visualization of choroidal morphology [2]. This study reported the case of a patient who developed temporary thickening and detachment of the choroid at the macula following an acute blunt ocular trauma, which was detected using OCT-EDI.

Case report

A 10-year-old boy was referred to the Department of Ophthalmology, University of Tübingen, 1 day following a blunt trauma to his right eye (RE) from

Ö. Dikmetas
Department of Ophthalmology, University of Kastamonu,
Kastamonu, Turkey

A. Abaza · F. Gelisken
Department of Ophthalmology, Eberhard-Karls
University, Tuebingen, Germany

F. Gelisken (✉)
Universitäts-Augenklinik, Elfriede-Aulhorn-Str. 7,
72076 Tuebingen, Germany
e-mail: faik.gelisken@med.uni-tuebingen.de

fireworks. He complained of loss of vision and pain in the RE. His past ocular history and family history of anamnesis were unremarkable. The RE had periorbital hyperemia and swelling of the eyelids. The pupils were isocoric and no relative afferent pupillary response was found. The Snellen best-corrected visual acuity (BCVA) was 20/200 RE and 20/20 left eye (LE). The slit-lamp examination revealed mild hemorrhage in the anterior chamber. The lens was clear. The intraocular pressure was 9 mmHg. Funduscopy revealed no abnormality at the posterior pole and in the periphery (Fig. 1a). The examination of the LE was unremarkable. A Spectralis OCT-EDI (Spectralis; Heidelberg Engineering; Heidelberg, Germany) showed a normal retinal morphology but increased choroidal thickness of 476 μm in the fovea. The

Haller's layer was separated from the sclera (Fig. 1b). The choroid of the LE was 289 μm thick in the fovea.

A systemic prednisolone therapy of 50 mg was initiated. Three days later, the Snellen BCVA was 20/20 in the RE and the hemorrhage had disappeared. OCT-EDI revealed choroidal thickness of 335 μm and attachment of the Haller's layer. Funduscopy of the RE was unremarkable. Oral prednisolone was tapered and discontinued within 2 weeks. Six months later, the patient had no complaints, and the vision was 20/20 RE. Intraocular pressure after recovery of visual acuity and choroidal detachment was 16 mmHg. Funduscopy revealed no abnormality and the choroidal thickness of the RE was 277 μm (Fig. 2).

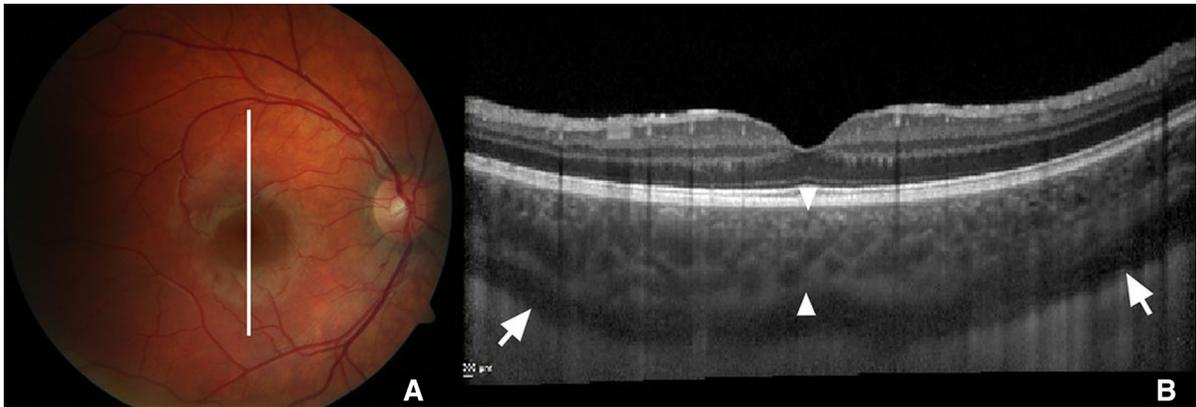


Fig. 1 a Color fundus photograph of the right eye shows normal posterior pole at the first presentation. b OCT-EDI showing thickening of the choroid (476 μm) (arrow heads) and separation of the Haller's layer from the sclera (white arrows)

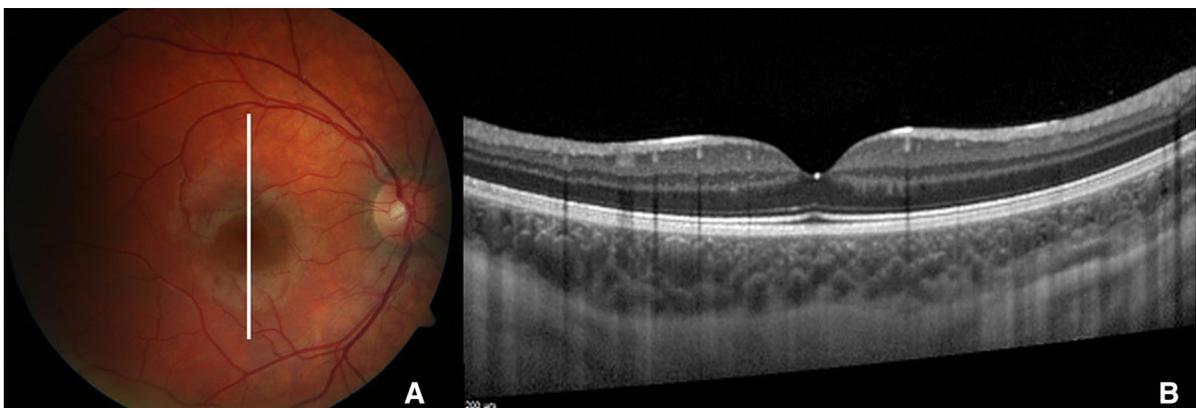


Fig. 2 a Color fundus photograph of the right eye 6 months later showing a normal posterior pole. b OCT-EDI revealed a normal choroidal thickness of 277 μm . No separation of the Haller's layer was seen

Discussion

Blunt ocular trauma may lead to various posterior segment complications, with or without affecting the choroid [1]. In the present case report, the OCT-EDI showed a temporary thickening of the choroid and separation of the Haller's layer. The choroid is usually differentiated into three vascular layers: choriocapillaris, Sattler's layer, and Haller's layer [3]. The Haller's layer containing the largest choroidal arteries and veins can be seen in round or oval shapes deep in the choroid [4, 5]. In this case report, the Haller's layer was separated from the sclera. This condition is also known as choroidal detachment, which may be serous and hemorrhagic. Trauma is one of the main causes of choroidal detachment [6]. The transudation of serum from the choroidal vessels following the trauma may explain both the choroidal detachment and the choroidal thickening. Additionally, choroidal thickness may change in response to intraocular or extraocular global pressure, because the choroidal vasculature can expand and contract easily [7]. In this case report, choroidal thickness improved during the observation, without any retinal changes. The choroidal detachment was mostly in the retinal periphery and could be diagnosed with fundus examination. An important feature in the present case was the normal-looking fundus despite choroidal changes, revealed by OCT-EDI. This aspect might be due to the fact that the choroidal detachment was extremely flat.

The visual loss of this case could be explained by the presence of hemorrhage. On the contrary, the effect of choroidal thickness on the visual acuity is not well known [8].

To the best of our knowledge, this is the first report of posttraumatic acute choroidopathy at the macula, characterized by a temporary thickening of the choroid and detachment. OCT-EDI provided more insight into the detection and monitoring of choroidal changes after ocular trauma without visible macular changes. Further study of similar cases with longer-term follow-up might clarify the clinical impact of this entity. The

clinicians should be aware of choroidal changes following blunt ocular trauma.

Compliance with ethical standards

Conflict of interest Author Özlem Dikmetas declares that she has no conflict of interest. Author Faik Gelisken has received a speaker honorarium from Company Novartis. Author Annegret Abaza declares that she has no conflict of interest.

Ethical approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards.

Informed consent Informed consent was obtained from the participant (from the parents) included in the study.

References

1. Williams DF, Mieler WF, Williams GA (1990) Posterior segment manifestations of ocular trauma. *Retina* 10(1):35–44
2. Spaide RF, Koizumi H, Pozzoni MC (2008) Enhanced depth imaging spectral-domain optical coherence tomography. *Am J Ophthalmol* 146(4):496–500. <https://doi.org/10.1016/j.ajo.2008.05.032>
3. Nickla DL, Wallman J (2010) The multifunctional choroid. *Prog Retin Eye Res* 29(2):144–168. <https://doi.org/10.1016/j.preteyeres.2009.12.002>
4. Guyer DR, Schachat AP, Green WR (2006) The choroid: structural considerations. In: Ryan SJ (ed) *Retina*, 4th edn. Elsevier Mosby, Philadelphia, pp 33–34
5. Branchini LA, Adhi M, Regatieri CV, Nandakumar N, Liu JJ, Laver N, Fujimoto JG, Duker JS (2013) Analysis of choroidal morphologic features and vasculature in healthy eyes using spectral-domain optical coherence tomography. *Ophthalmology* 120(9):1901–1908. <https://doi.org/10.1016/j.ophtha.2013.01.066>
6. Capper SA, Leopold IH (1956) Mechanism of serous choroidal detachment; a review and experimental study. *AMA Arch Ophthalmol* 55(1):101–113
7. Banitt M (2013) The choroid in glaucoma. *Curr Opin Ophthalmol* 24(2):125–129. <https://doi.org/10.1097/ICU.0b013e32835d9245>
8. Spaide RF (2014) The choroid and vision loss. *Am J Ophthalmol* 158(4):649–650. <https://doi.org/10.1016/j.ajo.2014.07.001>