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CASE REPORT/RESEARCH LETTER

Disappearance of circumscribed choroidal hemangiomas with photodynamic therapy

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Case presentation research letter

Choroidal hemangioma is a vascular hamartoma that may occur sporadically, in a circumscribed isolated form, or in association with Sturge—Weber syndrome, as a diffuse choroidal angiomatosis [1]. Circumscribed choroidal hemangioma (CCH) is almost always unilateral and typically presents in the macular and peripapillary area. Although it is a benign tumor, exudation from the lesion can lead to retinal detachment, cystoid macular edema and retinal pigment epithelium (RPE) atrophy, which can lead to significative visual loss [2].

Various therapeutic modalities are available for the treatment of symptomatic CCH, including laser coagulation, external beam radiation, transpupillary thermotherapy, intravitreal Anti-Vegf and photodynamic therapy (PDT). While many of these approaches are successful for extramacular lesions, treatment of macular lesions is more problematic as irreversible foveal damage may occur following treatment [1]. Therefore, photodynamic therapy (PDT) with verteporfin seems to be the ideal method for the treatment of CCH as it can offer site specific tumor destruction while sparing overlying retina and retinal vasculature.

Circumscribed choroidal hemangioma presents a characteristic behavior on ICG angiography. This tumor typically has an earliest hyperfluorescence achieved at a mean of 28 s, a maximal hyperfluorescence around 220 s and in the late frames all eyes demonstrate a decrease in fluorescence, with a characteristic washout of the dye [3]. ICG angiography remains one of the main diagnostic tools for the accurate identification and differential diagnosis of a CCH. It is also important in the monitorization of the vascular activity of CCH following treatment. Recently, the Spectral-Domain OCT (SD-OCT) with the EDI technology has allowed a better observation of the choroid, with an improvement of the resolution of the deeper layers of the choroid and the sclera. This method has been applied in the description of the intrinsic optical characteristics of choroidal tumors, and is nowadays another important tool in the differential diagnosis and follow-up of patients with CCH. On SD-OCT with EDI technology, CCH typically presents a low/medium reflectivity and a homogenous signal with large intrinsic spaces, probably of vascular origin [4].

The authors report two cases of CCH with macular exudation that were treated successfully with PDT. In both cases

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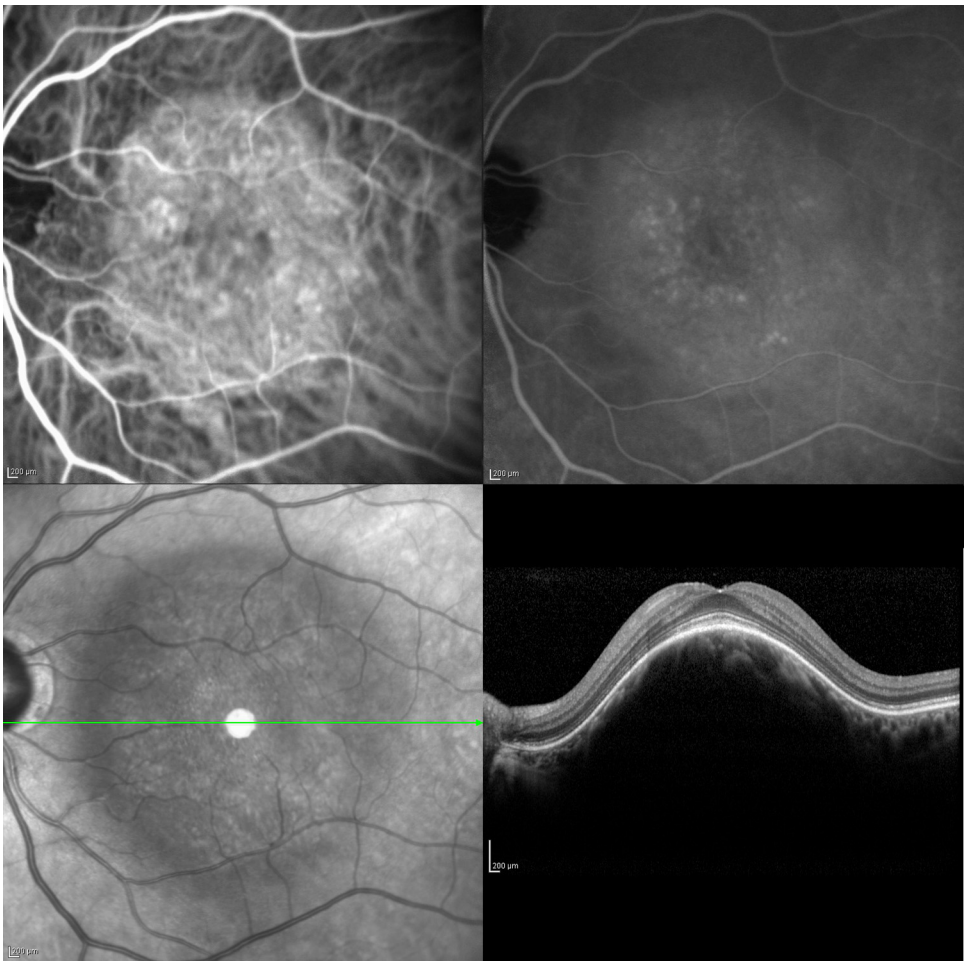

Fig. 1 Subfoveal CCH in the left eye before the photodynamic therapy. ICG angiography showing the earliest hyperfluorescence of the tumor (60 s) and a late frame with the characteristic washout of the dye (540 s) (top images). EDI SD-OCT showing the choroidal mass, with a medium reflectivity and a homogenous signal with large intrinsic spaces, probably of vascular origin (bottom images).

there was a disappearance of the vascular network of the tumor on ICG and a normalization of the thickness profile of choroid on SD-OCT.

Patient 1: A 66-year-old woman, presented a subfoveal tumor in the left eye with associated subretinal fluid and a recent visual acuity (VA) decrease to 2/10 (Fig. 1). Patient 2: A 54-year-old man presented a juxtafoveal tumor in the right eye with large intra- and subretinal fluid exudation and a VA lower than 1/10. The complaints of low visual acuity of this patient had been more than 1 year.

The diagnosis and the follow-up of CCH was performed with ICG angiography, spectralis OCT with EDI technology and B-scan ultrasonography.

Both patients were treated with photodynamic therapy, using the standard AMD protocol for infusion and activation of verteporfin (verteporfin was infused at a concentration of 6 mg/m^2 over 10 min and laser diode (689 nm) was applied 5 min after infusion — intensity 600 mW/cm^2, power 50 J/cm^2, duration 83 s). In both cases a single spot was used to cover the entire surface of the tumor. Patient 1 required two sessions and patient 2 required three sessions of PDT, applied with intervals of two months, until complete disappearance of the tumor on ICG and SD-OCT. In patient 1 the exudation disappeared after one treatment session and in patient 2 after two sessions, but in both cases another treatment session was applied with the aim of normalization of choroid morphology and thickness. A close monitoring of tumor response and choroidal perfusion was done using ICG angiography in both cases. Retreatment was applied only in areas of residual tumor on angiography, avoiding additional exposure of areas with reduced choroidal perfusion or areas of physiological choroid.

Patient 1 had an improvement of visual acuity to 9/10 and completed 24 months of follow-up without signs of recurrence. Patient 2 had a poor visual acuity recovery due to longstanding macular edema and RPE atrophic changes, presenting a visual acuity of 1/10. This patient completed 20 months of follow-up without signs of recurrence too.

Both cases showed complete disappearance of the lesion on ICG angiography, with normalization of choroidal vascular tree and the disappearance of the characteristic hyperfluorescence and vascular leakage of the tumor (Fig. 2). None of the patients showed focal areas of choroidal atrophy after treatment with PDT. The EDI SD-OCT showed a great improvement, with a near normal profile of the choroidal