
SHORT COMMUNICATION

Unfavorable effect of photodynamic therapy for late subretinal neovascularization with chorioretinal anastomoses associated with idiopathic multiple serous detachments of the retinal pigment epithelium

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PURPOSE. *To describe a case of a 46-year-old woman with an asymptomatic history of unilateral multiple serous detachments of the retinal pigment epithelium (PED) in the right eye, treated with photodynamic therapy (PDT) with verteporfin for recent onset of subfoveal choroidal neovascularization (CNV) with chorioretinal anastomoses (CRA).*

METHODS. *Case report.*

RESULTS. *Fluorescein and indocyanine green (ICG) angiography, performed with a Heidelberg scanning laser ophthalmoscope (SLO), demonstrated a predominantly classic foveal choroidal neovascular membrane associated with a PED and 1 one retinal and 2 two venous chorioretinal anastomoses. The left fundus was normal. PDT therapy was performed according to standard techniques. Three PDT treatments were performed at an interval of 3 months. Three months after the second PDT, visual acuity dropped to 20/200, with an enlargement of the neovascular network. One month after the third treatment, visual acuity deteriorated further and the CRA appeared enlarged, associated with a dense fibrotic reaction in the center of the lesion.*

CONCLUSIONS. *This clinical observation demonstrates that idiopathic serous detachments of the retinal pigment epithelium may represent predisposing changes to CNV development, and in the case CNV is associated with CRA, PDT may be unsuccessful. (Eur J Ophthalmol 2004; 14: 568-71)*

KEY WORDS. *Chorioretinal anastomoses, Choroidal neovascularization, Idiopathic serous detachment of retinal pigment epithelium, Photodynamic therapy, Verteporfin*

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INTRODUCTION

Single or multiple detachments of the retinal pigment epithelium (PED) in young patients are believed to represent a variant of idiopathic central serous chorioretinopathy (ICSC) (1, 2), and constitutes a relatively uncommon entity named "idiopathic serous detachment of the retinal pigment epithelium" (3-5). Although choroidal neovascu-

larization (CNV) may occur associated with ICSC (6), usually it is not observed in juvenile PED (7, 8): the visual prognosis in this entity is good, and no treatment is indicated (8). We describe a patient affected by unilateral idiopathic multiple serous PED at the age of 33 years, who 13 years later developed subfoveal CNV with chorioretinal anastomoses (CRA), and demonstrated an unfavorable course during photodynamic therapy (PDT) with verteporfin.

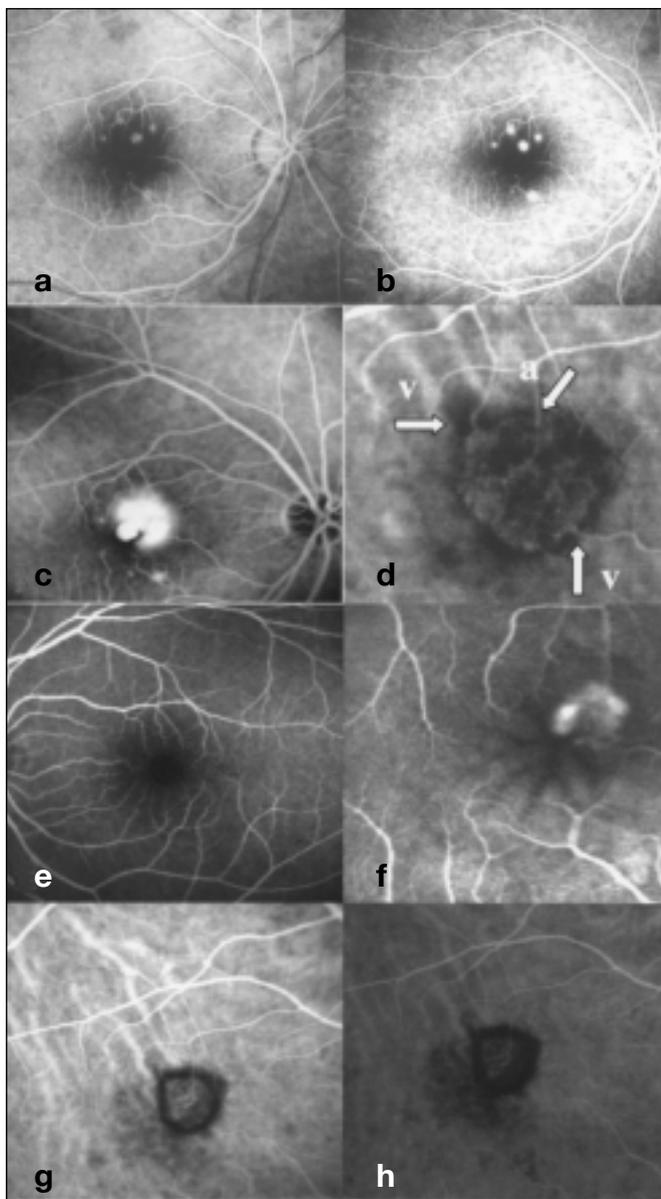


Fig. 1. - (a, b) Early and late fluorescein angiograms of the right macula. There are multiple, small serous detachments of the retinal pigment epithelium in the central area. (c) Scanning laser ophthalmoscope SLO fluorescein 30° frame and (d) indocyanine green (ICG) 10° frame of the same right fundus observed 13 years later: there is a prevalent classical subfoveal choroidal neovascularization CNV membrane, with a small detachment of the retinal pigment epithelium (PED) at the edge of the lesion, associated with chorioretinal anastomoses (arrows), one of arterial type (a), and two of venous type (v). (e) Fluorescein frame of the normal left fundus. (f) One month after the first photodynamic therapy, fluorescein frame shows a flattening of PED associated with radial folds of the retinal pigment epithelium; (g, h) ICG frames demonstrate blocked fluorescence around the neovascular network, with longstanding chorioretinal anastomoses.

Case report

A 46-year-old woman with an asymptomatic history of unilateral multiple serous PED in the right eye, discovered during a routine visit 13 years before and documented by fluorescein angiography (Fig. 1, a and b), was referred to the Retina Clinic for decreased vision and metamorphopsia in the right eye. Visual acuity (VA) was 20/25 with significant distortion in the right eye, and 20/20 in the left eye. The patient's medical history was negative. Anterior segment evaluation was normal. The right fundus examination revealed a macular serous detachment: fluorescein and indocyanine green (ICG) angiography, performed with a Heidelberg scanning laser ophthalmoscope (SLO), demonstrated a predominantly classical subfoveal choroidal neovascular membrane associated with a PED (Fig. 1c) and three chorioretinal anastomoses, one of arterial (a), and two of venous (v) origin (Fig. 1d). The left fundus was normal (Fig. 1e). PDT was suggested, and was performed according to standard techniques, after informed consent. One month after treatment, a partial closure of the neovascular network was observed: the PED had flattened, but a number of radial folds of the retinal pigment epithelium (RPE) arose from the edge of the lesion where PED was previously located (Fig. 1f); the vascular network appeared surrounded by a ring of hypofluorescence. Chorioretinal anastomoses were unchanged (Fig. 1, g and h). Metamorphopsia improved, but VA worsened to 20/32. Three months after treatment, the subretinal exudation appeared increased (Fig. 2), with a VA reduced to 20/50, so that a second PDT was applied. Three months after the second PDT, VA dropped to 20/200, and SLO examination at this time showed a progression of subretinal exudation with the formation of retinal cysts (Fig. 3a); the neovascular network, including the anastomoses, appeared enlarged (Fig. 3b). It was decided to apply a third PDT treatment. One month later, the lesion appeared enlarged, with clearcut signs of cystoid macular edema (Fig. 3c); the vascular network and chorioretinal anastomoses were further expanded (Fig. 3d), with a dense fibrotic reaction, involving the center of the lesion. VA at this time was 20/400. The patient then refused further treatments. Six months later the patient was seen again because she noticed a sudden reduction of her residual VA. Fundus examination revealed a large subretinal he-

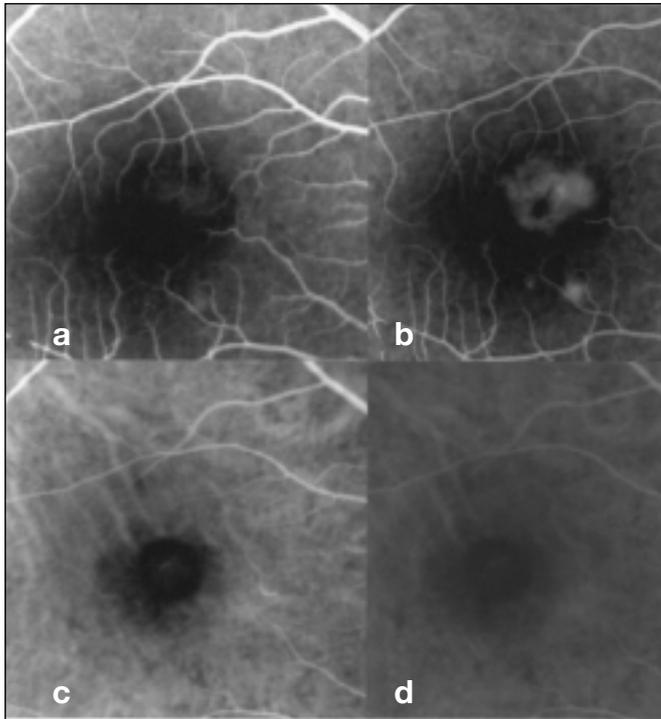


Fig. 2. - (a, b) Three months after the first photodynamic therapy, the early and late fluorescein frames show an enlargement of the lesion in the upper part of the macula. (c, d) In the early and late indocyanine green angiograms a ring of blocked fluorescence surrounds the neovascular complex.

morrhage in the posterior pole, and SLO frames demonstrated a still active and growing lesion (Fig. 3, e, and f).

DISCUSSION

CNV and CRA are known to occur in several different types of maculopathies where Bruch membrane is presumably injured, including infections of organisms such as toxoplasmosis, photocoagulation, trauma, postradiation, vasoproliferative chorioretinal tumors, idiopathic perifoveal teleangiectasia, and neovascular age-related macular degeneration. Although CNV is a well-recognized complication of ICSC (9), particularly in older adults (10), CRA have never been described in this entity. In general, it is believed that a condition of choriocapillaris hyperpermeability plays a fundamental role in the pathogenesis of ICSC and of serous detachments of RPE (11, 12). It is not clear, however, under what conditions CNV will

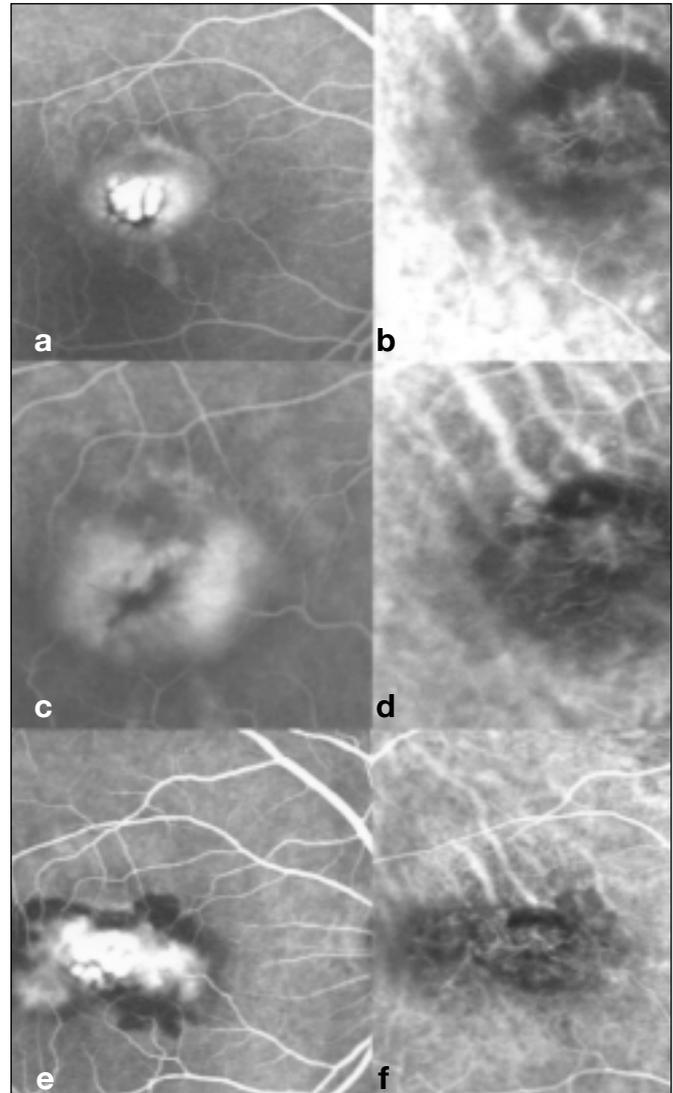


Fig. 3. - (a) Three months after the second photodynamic therapy (PDT), fluorescein image shows an enlargement of the lesion and (b) indocyanine green (ICG) image reveals an enlargement of the vascular network, with well evident chorioretinal shunts. (c) One month after the 3rd third PDT, the lesion appears further enlarged and thickened, with a marked cystoid edema; (d) the chorioretinal shunts have evolved into a more complex network. (e, f) Six months after the third PDT, a large subretinal hemorrhage occurred in the posterior pole, and scanning laser ophthalmoscope frames (fluorescein and ICG) show a still active and growing lesion.

eventually occur. Moreover, long-term follow-up studies of nonsenile detachment of the retinal pigment epithelium do not indicate the risk of CNV (8). In our patient, with a history of unilateral idiopathic multiple serous detachments of the macular RPE, CRA were observed at the time of the diagnosis of CNV, and it may be assumed that they developed after a

time of clinically silent phase of occult subretinal neovascularization. As regards their pathogenesis, different hypotheses may be proposed. The first is that these two entities, RPE serous detachments and CNV, infrequently observed at younger age, occurred together in this patient by chance, pathogenetically unrelated to each other, and therefore represent a very rare observation. The second hypothesis is that the fluid accumulating underneath the RPE was able with time to induce degenerative changes and breaks in Bruch membrane, which allowed CNV under the RPE. These new vessels with time invaded the retina, to eventually form a chorioretinal anastomosis. A complementary role of PEGF and VEGF cannot be ruled out.

At least three reports suggest that PDT with verteporfin may be beneficial in the treatment of idiopathic subfoveal choroidal neovascular lesions in people less than 55 years of age, including cases with IC-SC and PED (13-15). In these series, however, CNV was never associated with CRA. In our case, PDT was able to flatten the PED and to reduce temporarily the

exudation of the lesion, but the neovascular network and the chorioretinal shunts enlarged further, with progressive reduction of visual acuity. We believe, in accordance with similar observations (16), that CRA are scarcely affected by PDT, and that in this case of juvenile CNV associated with multiple serous RPE detachments, they may have contributed to the failure of the treatment. Likely, CRA may be considered stable structures, which are unable to regulate the uptake of verteporfin, because they do not express enough LDL receptors, as rapidly growing new vessels must do. Moreover, a large vessel lumen diameter and a high blood flow velocity might render very difficult the process of platelet aggregation in CRA.

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