Late development of subretinal vascularization after argon laser treatment in senile disciform macular degeneration

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Recently, many papers have been published concerning the development of subretinal neovascularization after argon laser photocoagulation applied to the treatment of some retinal diseases (Schatz, H. and Patz, A. 1973; François, J. et al., 1975; Galinos, S.O. et al., 1975; Fine, S.L. et al., 1976; Schatz et al., 1977; Gass, J.D.M. 1977; Watzke, R.C., 1977). In addition, special care is given to cases in which the diagnosis lies between Idiopathic Central Serous Choroidopathy (ICSC) and serous detachment of the pigment epithelium secondary to a subretinal neovascularization. When argon laser treatment is suggested there is a question as to the technique to be used because it varies from one case to the other.

In the case presented we have had this kind of problem and so the patient was carefully observed before suggesting photocoagulation, even though there was a development of a subretinal neovascularization 4 months after treatment, following initial involution of the disease, differing from other cases, in which neovascularization developed in an average of from 3 to 5 weeks after treatment (Schatz, H. et al., 1977; Gass, J.D.M., 1977; Watzke, R.C., 1977). A paper on the late development of subretinal neovascularization has been already published, but concerning only cases of presumed histoplasmosis syndrome (Fine, S.L. et al., 1976).

EQUIPMENT

The fluorescein angiograms were photographed using a Carl Zeiss fundus camera with Kodak Plus-X-Pan (125 ASA) film. Before angiography, 5 ml of 20% sodium fluorescein was injected into an anticubital vein. The camera was equiped with an exciter filter number 485 and a barrier filter number 520, both from Carl Zeiss.

The laser photocoagulator was from Optical Technology.

CASE REPORT

A 63 year-old-male noticed blurred vision, micropsia and a dark spot in front of his right eye for 10 days. He has undergone a facectomie in his right eye six years ago and in his left eye 4 years ago. Further history revealed that he suffered from many attacks of malaria. On examination his visual acuity was 20/25 — and 2 on the Jaeger test in his right eye, and 20/20, and 1 on the Jaerger test in his left eye. In the entopic phenomenon for his right eye he recognized the dark spot. The Amsler grid confirmed a positive scotoma in the right eye. There was a serous detachment of the sensory retina of the right macula of about one disc diameter. Behind the sensory retina — clear fluid — there was a slight elevation of the pigment epithelium, inferonasal to the central fovea of about 250 micra in size with paler discoloration than the rest of the fundus. The fluorescein angiography showed irregular pooling of the pigment epithelium detachment in the initial phase. In a later phase the central hyperfluorescence of the pigment epithelium detachment was brighter and the surrounding area presented a spotty hyperfluorescence (fig. 1). The angiogram in his left eye was normal. The situation was explained to the patient and he remained under observation.

The follow-up both clinical and angiographical was done periodically, every 3 weeks. In the 9th week we noticed some yellow puctiform precipitates under the sensory retina, and the fluorescein angiography unchanged, A week later the patient came back and decided to be photocoagulated. Argon laser photocoagulation was directed to the pigment epithelium detachment using 100 micra lesion 150-200 mW and 0,2 seconds. We thought them to be medium burn lesions. Three weeks later he came back to a new follow-up examination, stating invo-

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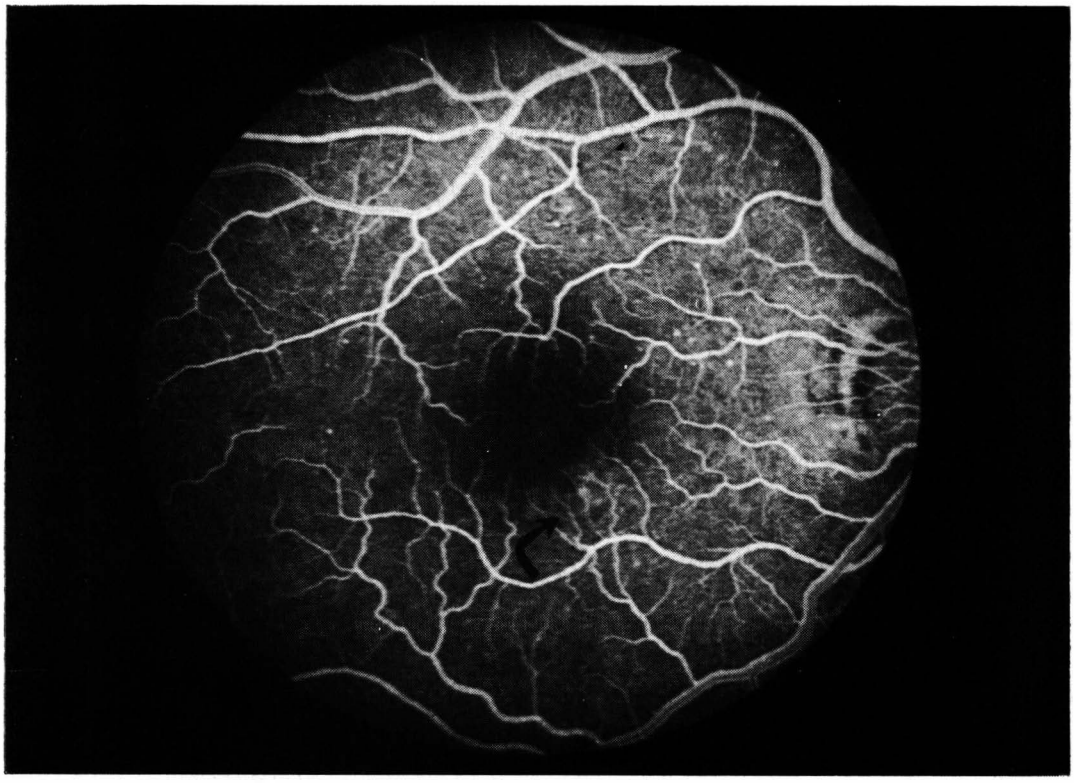

Fig. 1 — (Bonomo) Fluorescein angiography on initial examination of the right eye.
(a) Arteriovenous phase, showing initial and irregular pooling of fluorescein under the pigment epithelium detachment (arrow). Note some window defects of pigment epithelium superior to the macula.

lution of the symptoms. On examination the visual acuity of his right eye was 20/20 — and 1 on the Jaeger test. There was a resolution of the sub-sensory retina fluid and in the same place of the pigment epithelium detachment there were only slight apparent scars. The punctiforme precipitates remained unchanged. The fluorescein angiography confirmed the clinical aspects. The patient was asked to return in six months.

Five months after argon laser treatment he returned stating that the symptoms had come back a month ago and were getting worse as time went by. On examination his visual acuity of the right eye was 20/40 — and 4 on the Jaeger test. There was a shallow detachment of the sensory retina in the macular area and a yellowish plaque at the level of the pigment epithelium. The fluorescein angiography showed a subretinal neovascularization tuft. (Fig. 2). Because of the position of the neovascularization photocoagulation could not be repeated.

DISCUSSION

When the patient was first seen, a diagnosis of SDMD (Gass, J.D.M., 1967b) and not ICSC (Gass J.D.M., 1967a) was made, in spite of the disease being unilateral with no significant "drusen" seen, either clinically or angiographically. Even not being a typical "drusiform" case of senile disciform macular degeneration, we had not eliminated the possibility of non-identified subretinal neovascularization either clinically or angiographically (Burton, T.C. 1972), particularly in the case of a senile eye (Sarks, S.H. 1973). We decided not to photocoagulate and observe the follow-up. During the whole follow-up period before photocoagulation (10 weeks) the situation remained unchanged and none of the ophthalmoscopic features which may have suggested the presence of subretinal neovascularization were detected (Teeters, V.W. and Bird, A.C., 1973a). The fluorescein angiography did not show any significant alteration, in spite of being quite unlike the appearance of a sim-

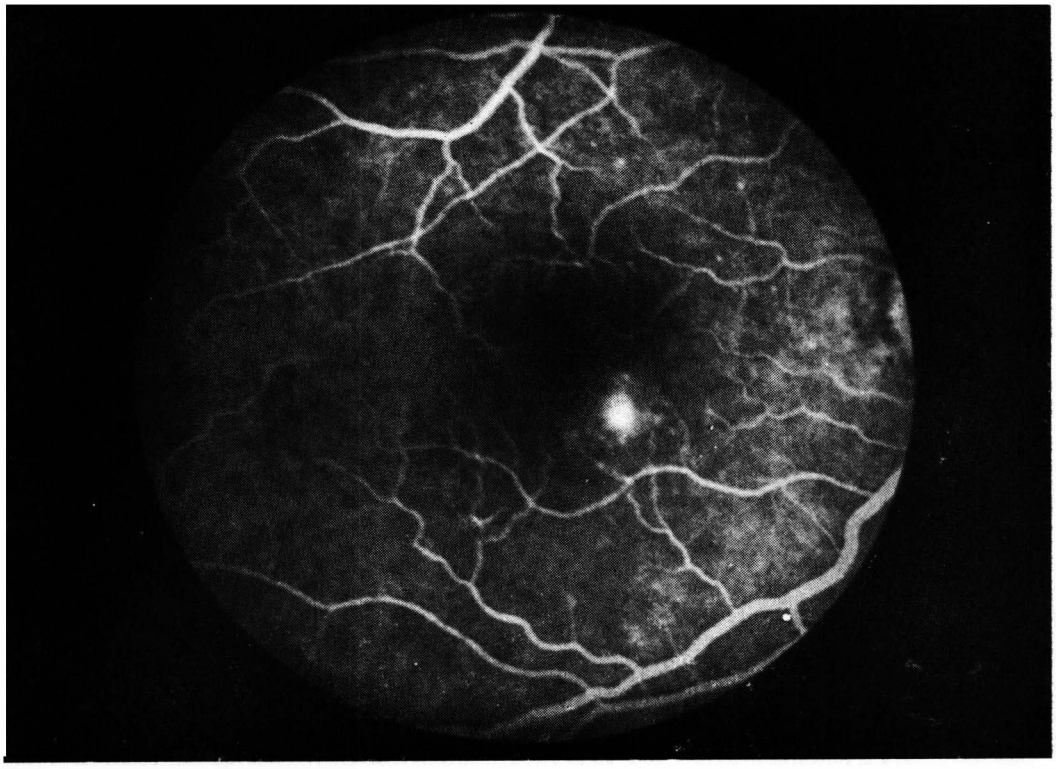

Fig. 1 — (Bonomo).
(b) Late phase demonstrating the brighter hyperfluorescein in the central part of pigment epithelium detachment surrounded by spotty hyperfluorescence.

ple pigment epithelium detachment. We decided not to photocoagulate and kept the patient under observation until the last follow-up examination (9th week) before photocoagulation. However in the 10th week he came back and chose to undergo laser treatment because of the thought of remaining this way for another long period.

We planned the photocoagulation considering the following: a) not to photocoagulate with low intensity just to close the leaking point as proposed by Greite et al. but with sufficient energy to close the capillary plexus, that. if present, would be in the form of small vessels (Teeters, V.M. and Bird A.C. 1973b); B) not to photocoagulate heavily so as to avoid bleeding (if capillary plexus were present), and to avoid macular distortion secondary to a contraction of a preretinal vitreous membrane and evitate large para central scotoma (Gass, J.D.M., 1972).

With the technique already described we got medium intensity burns. We left the patient three weeks after argon laser treatment in normal condition. However 4 months after treatment the symptoms appeared again and 5 months after photocoagulation, when the patient returned for examination we detected a patch of subretinal neovascularization at the site of the initial leaking point and where we had shot the argon laser.

There are some experimental studies about the structural alterations of neuroepithelium, pigment epithelium and choriocapillaris after laser (Apple. D.J. et al., 1973; Marshall, J. et al., 1975) or xenon photocoagulation (Curtin, V.T. and Norton, E.W.D., 1963), but little information on the Bruch membrane and no information about the effects of photocoagulation of ICSC and subretinal neovascularization. Lacking this, and a well-defined natural course of this macular disease, definitive conclusions are difficult to arrive at. We can only speculate and make suppositions. After the late development of subretinal neovascularization the first hypothesis would be that of the growth of a neovascular membrane as a natural course of the

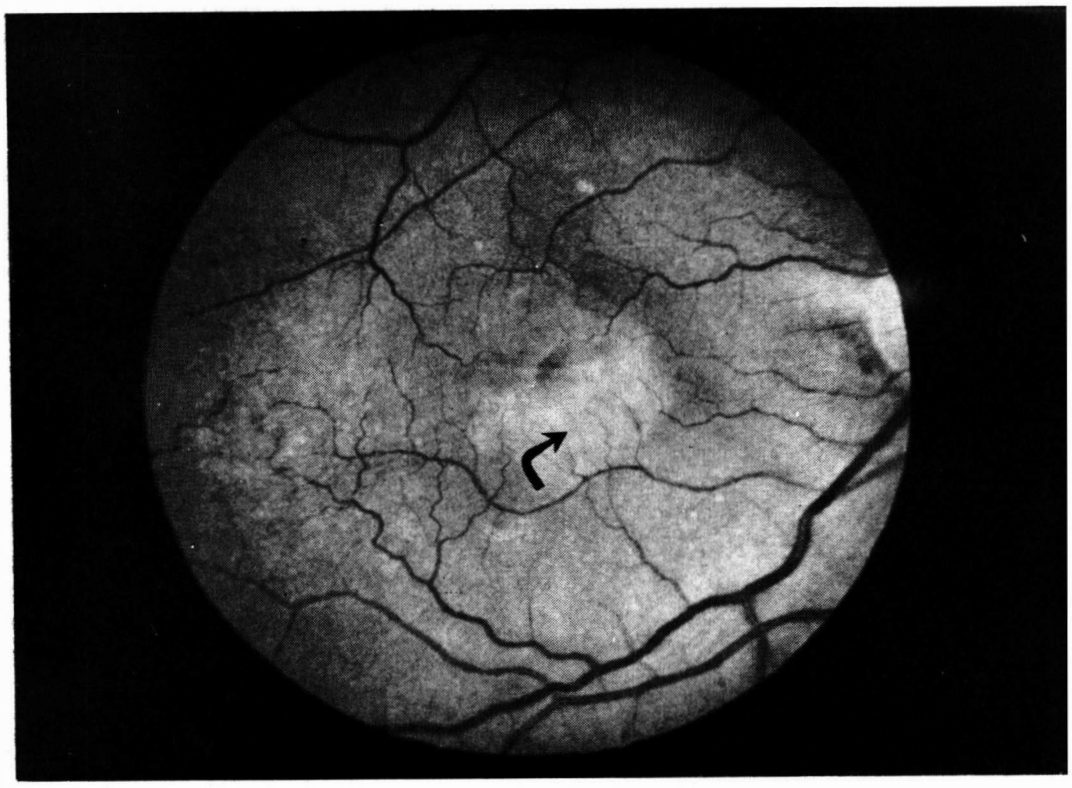

Fig. 2 — (Boromo). Five months after argon laser treatment.
(a) Red-free photograph of right macula showing a yellowish plaque at the level of pigment epithelium (arrow).

serous and a vascular pigment epithelium detachment that appears in the senile disciform macular degeneration (Teeters, V.W. and Bird, A.C. 1973b). However in Teeters and Bird's observation the serous detachment of the pigment epithelium had not undergone involution either spontaneously or by laser treatment. In the case that this is not a natural course of the disease, two other possibilities have to be considered: a) if there was not subretinal neovascularization before treatment perhaps the argon laser stimulated the development of a neovascular membrane which manifestated itself clinically late possibly because it had taken more time to cross the Bruch membrane, less damaged by the medium intensity shots of photocoagulation; b) if there was already a subretinal neovascularization the treatment was sufficient to close it, but could have stimulated the appearance of others that took longer to manifest clinically depending also on the condition of the alterations of the Bruch membrane.

We did not consider the possibility of partial closure of the neovascularization because of the involution of the disease.

Comparing the technique of photocoagulation in this case with other cases already presented, it seems that in eyes predisposed to this kind of problem there is no direct dependency on the intensity of photocoagulation because low (Patz, A. et al., 1974) or heavy (François, J. et al., 1975; Galinos, S. O. et al., 1975) laser treatment can stimulate the development of a subretinal neovascularization.

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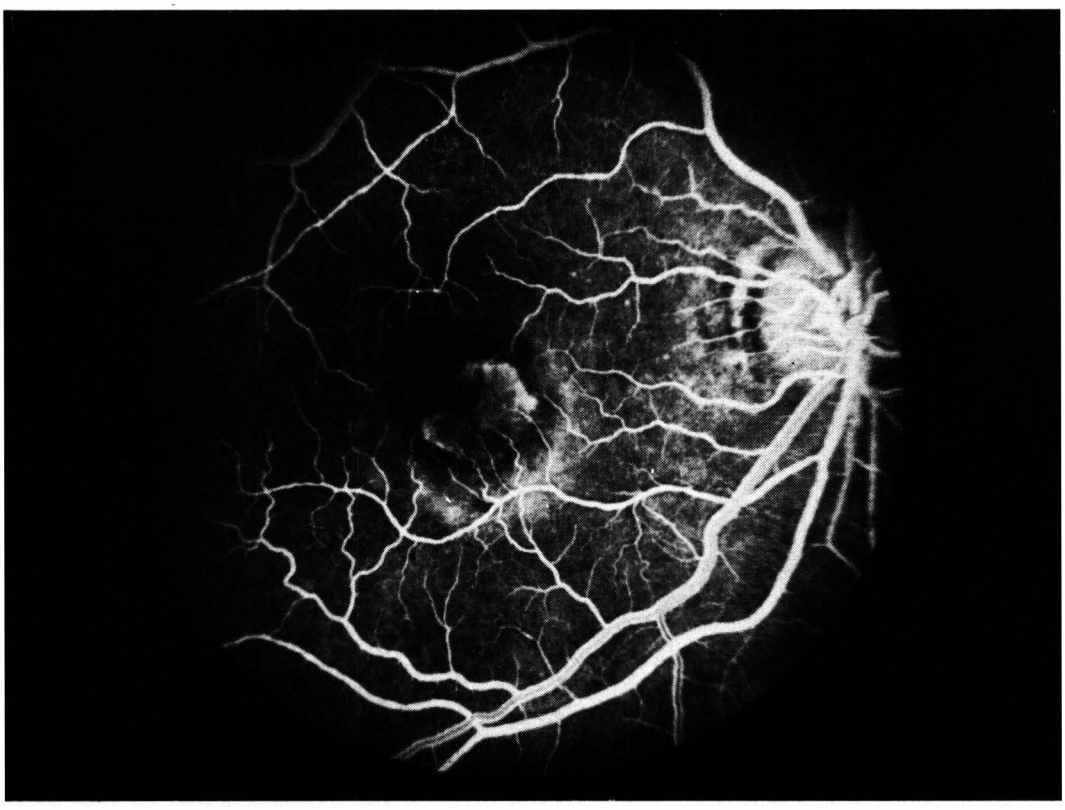

Fig. 2 — (Bonomo).
(b) Arteriovenous phase demonstrating the subretinal neovascularization tuft.

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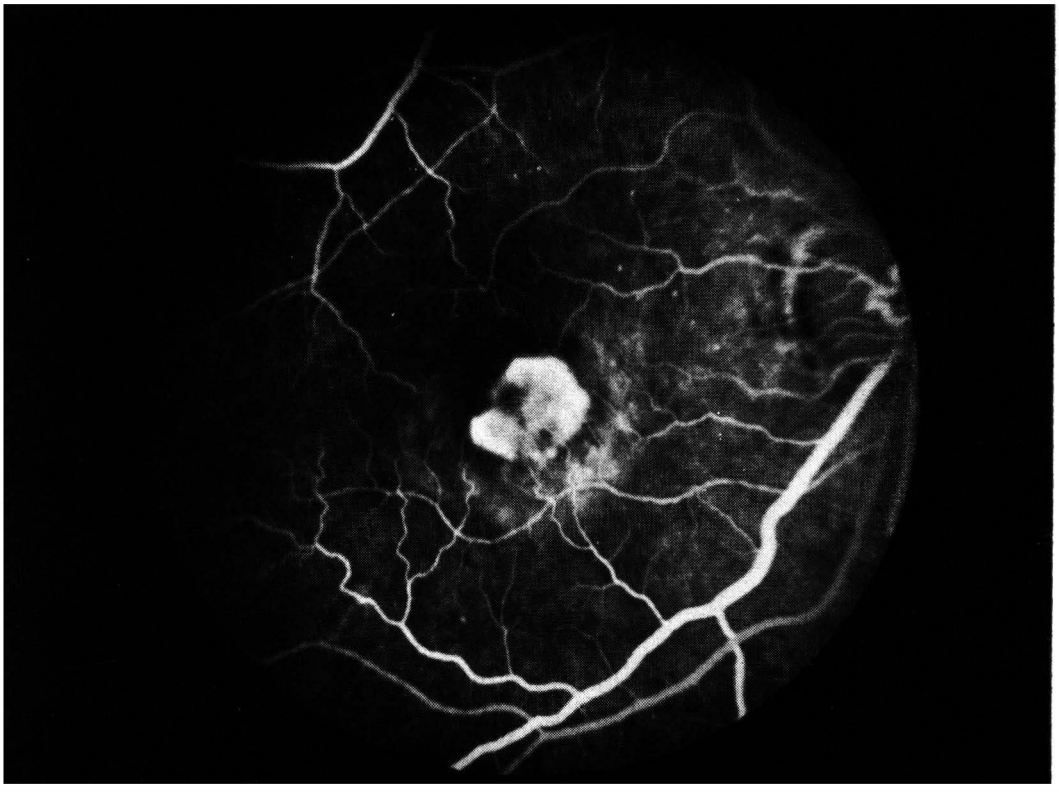

Fig. 2 — (Bonomo).
(c) Late phase, with increased fluorescence of the lesion.

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