Case report

Diode laser photoacoagulation of choroidal hemangioma

P. Lanzetta, G. Virgili, E. Ferrari & U. Menchini
Department of Ophthalmology, University of Udine, Italy

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Abstract

Background: The argon laser photoacoagulation has recently become the treatment of choice in choroidal hemangioma. We evaluated the efficacy of the near infrared wavelength diode laser in the treatment of such tumours. This wavelength is not highly absorbed by the retinal pigment epithelium and penetrates deep into the choroid.

Methods: Two cases of choroidal haemangioma with a serous detachment of the neural retina were diagnosed with ophthalmoscopy, fluorescein and indocyanine green angiography, A-scan and B-scan ultrasonography and treated with a surface photocoagulation with a diode laser. The efficacy of photocoagulation was evaluated three, six, twelve and fifteen months after laser treatment.

Results: The resorption of the subretinal fluid and a reduction in thickness of the tumour followed laser photocoagulation.

Conclusions: Diode lasers might be effective in the treatment of choroidal hemangioma.

Introduction

Choroidal hemangioma (CH) is not a particularly common form of intraocular tumour. This type of vascular hamartoma is usually described in two different forms: a circumscribed form without any systemic implications, and another, more diffused form, associated with the Sturge-Weber syndrome.

In our case history, we have considered two cases of CH in the circumscribed form. This tumour is characterized by an orange colour and is usually present in the juxtapapillary and macular areas.

Some years ago, a good number of eyes affected by this type of hamartoma were subjected to enucleation because of the difficulty of a differential diagnosis with choroidal melanomas [1-3]. More recently, in addition to the greater clinical description of these tumours, various diagnostic techniques have become available including fluorescein angiogram, ultrasonography, the radioactive phosphorous uptake test and lastly, indocyanine green angiogram [4-7].

In an attempt to correct the compromise of visual acuity resulting from the secondary serous detachment of the neural retina, various therapeutic possibilities have been proposed such as transcleral and penetrating diathermy [8], transcleral cryotherapy [9], the application of episcleral cobalt plaques [10], external beam radiation [11, 12] accelerated proton beam [11, 13] and lastly, photoacoagulation with laser sources [14]. At the present time, laser photoacoagulation is the most widely used and its use is limited to tumours associated with a serous detachment of the neural retina [15-23].

There are basically two techniques offered by photoacoagulation. The first consists in the intense and confluent photoacoagulation of the entire tumour so as to induce its obliteration. Usually, several treatment sessions are required. When L'Esperance proposed this therapeutic approach, he reported a greater penetration of the choroid by a xenon arc with respect to argon laser, with a resulting greater efficacy [18].

The other technique, as reported by Gass, consists in the photoacoagulation of the entire surface of the tumour for the purpose of reducing or blocking the accumulation of subretinal fluid and to promote its reabsorption [16, 24]. According to Gass, this technique would be efficacious in collapsing the retina on the tumour surface with the complete resolution of all the subretinal liquid.
Leaving aside treatment techniques, various sources for CH photocoagulation have been proposed and evaluated over the years: xenon arc, argon, krypton and dye lasers [14]. For some time now, a semiconductor diode laser has been available which emits at 805–810 nm in the near infrared wavelength. Since the physical characteristics of this laser source mean that an application could be find for the treatment of choroidal tumours, we wanted to evaluate its efficacy of CH treatment.

Patients and methods

Two CH case histories of the circumscribed type have been included in this study.

Patient 1
E.L., 74 year old male, right eye affected by localized CH in the inferopapillary site with an extension of around four papillary diameters and a lesion of around 3 mm thick. The tumoural lesion was also associated with a serous detachment of the neural retina, retinal pigment epithelium atrophic tracts and occult choroidal neovascular membrane in age related macular degeneration. The visual acuity was 0.8 with best correction (Figures 1a, 2a, 3a).

The patient had been sent to us for evaluation of the choroidal neovascularization. The diagnosis of the CH was therefore by chance.

Patient 2
B.M., 46 year old male, right eye affected by localized CH in the superopapillary site with an extension of around eight papillary diameters and over 3 mm thick. The CH was associated with a serous detachment of the neural retina, retinal pigment epithelium atrophic tracts and a cystoid macular edema. The visual acuity was 0.5 with best correction (Figures 1b, 2b, 3b).

Prior to and after photocoagulation treatment (every three months), the patients underwent colour retinography, fluorescein angiogram, indocyanine green angiogram, A-scan and B-scan ocular ultrasonography.

Treatment was carried out with a diode laser (Visulas diode by Zeiss; 807 nm). In this equipment, the slip lamp and the laser beam are coupled coaxially with optic fibre and the light spot of the slit and the laser beam move together in unison.

The aim of the treatment was to create a chorioretinal adhesion to facilitate reattachment of the retina and the resolution of the subretinal fluid. Photocoagulation was carried out using a Goldmann three-mirror lens with anti-reflection treatment for diode laser and obtaining a whitening of the retinal surface above the tumoural lesion. Powers of between 800 and 1,000 mW were used with a spot diameter of 500 mm. The exposure time, regulated on the pedal by the operator according to the appearance of the retinal whitening, was a maximum of 0.5 seconds. A surface photocoagulation was applied producing a white reaction on the tumour (Fig. 4).

Results

The symptoms reported by the two patients prior to laser treatment included both a reduction in visual acuity along with the presence of metamorphopsia. The follow-up, from the time of being included in the study, was for 16 months in the case of patient 1 and 12 months for patient 2.

In the first case history, three photocoagulative sessions were performed at intervals of 0, 3 and 11 months. In the second case history, two photocoagulative sessions were performed at intervals of 0 and 4 months.

The two eyes studied showed a re-settlement of the serous detachment of the neural retina after the first session of treatment over a period of time ranging between 1 to 3 months. There was an improvement in visual acuity as a result of the resolution of the serous detachment of the neural retina; in patient 1 there was an improvement from 0.8 to 1 and in patient 2 from 0.5 to 0.9.

As far as the efficacy of laser photocoagulative treatment in controlling the secondary retinal detachment and reduction of the tumour mass is concerned, we based our observations on the ophthalmoscopic aspect, fluorescein angiogram, indocyanine green angiogram and ultrasonography.

In the case of patient 1, the resorption of the subretinal fluid along with a chorioretinal adhesion and atrophy associated with a regression of the tumour vessels was confirmed both from the ophthalmoscopic aspect and from angiogram. (Figures 5a, 5c, 6a)

In patient 2, ophthalmoscopic examination confirmed the presence of the chorio-retinal adhesion and atrophy with the resolution of the subretinal fluid where the CH had previously been localized. (Fig. 5b) It was difficult to interpret the fluores-