CONTINUOUS BEAM ARGON LASER IN EXTRA-FOVEAL CHOROIDAL NEOVASCULARISATION DUE TO AGE-RELATED MACULAR DEGENERATION

(A Report on 3 Cases)

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Introduction

The most common cause of choroidal neovascularisation (CNV) is age-related macular degeneration (AMD) [1]. The aim of treatment of this neovascular membrane is the complete annihilation of the lesion [2]. Of the various modalities available to treat CNV secondary to AMD, laser surgery has been extensively studied and to date is of proven value. This is particularly so in those patients who have extrafoveal CNV and who meet the eligibility criteria laid out in the macular photocoagulation studies (MPS) [3,4].

The immediate goal of treatment is to photocoagulate the entire neovascular membrane. In the MPS technique for extrafoveal CNV using argon-green laser after a test burn using a 200 micron spot size and a duration of 0.2 s the foveal edge of the membrane is treated with overlapping 200 micron burns of 0.2 to 0.5 s duration. After treating the foveal edge, the rest of the membrane is outlined with overlapping edges and finally the entire membrane is treated with overlapping burns of sufficient intensity (200-500 microns, 0.5 to 1.0 s) to produce marked whitening. To ensure adequate treatment, the MPS protocol required that the entire CNV lesion be covered by a uniformly intense area of whitening extending 100 microns beyond the angiographically visible hyperfluorescence for extrafoveal and subfoveal lesions [2].

With these aims and end results in view, we have also used argon-green laser but with a differ-

ent technique than that advised by the MPS. Instead of treating the membrane with confluent spots a continuous beam setting of argon-green was used. By employing this continuous beam the entire lesion was first rounded-off starting from the foveal edge. Once the perimeter was treated, the centre of the lesion was then 'streaked' with continuous beam application. Only extrafoveal cases were treated and the results of three such cases is being presented herewith.

Case Report 1

A 67-year-old male patient presented with diminution of vision and distortion of images in the left eye of insidious onset and gradual progression of a few weeks duration. Anterior segments were normal in both eyes. Right eye had a corrected visual acuity of 6/12 with macular colloids. Left eye had an unimprovable visual acuity of 6/60 with an ill-defined whitish exudative lesion superotemporal to the fovea (Fig 1a). Fluorescein angiography revealed a well delineated choroidal neovascular membrane corroborating the clinical diagnosis of an extrafoveal classical CNV.

The patient was subjected to argon-green laser therapy using the continuous beam mode. A uniform whitening was obtained with 100 microns at 150 mW. Follow-up fluorescein angiography after 6 weeks showed no leakage in the lesion with a corrected visual acuity of 6/18 (Fig 1b).

Case Report 2

A 50-year-old male presented with complaints of metamorphopsia in the left eye of 2 weeks duration. Anterior segment was normal. Fundus examination revealed soft drusen in both the maculae with a suspicious choroidal neovascular membrane in the left eye. Fluorescein angiography revealed a well-defined extrafoveal CNV inferonasal to the centre of the fovea (Fig 2a). The patient was subjected to continuous beam argon-green laser

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Fig. 1a : Extrafoveal choroidal neovascular membrane (pre laser - Case 1)

Fig 1b : Same patient (post laser) showing adequate laser scar

treatment using a spot size of 100 micron and a power of 150 mW. Two weeks later visual acuity was 6/9. Fluorescein angiography done after 3 months revealed an adequate laser scar with no recurrence of CNV (Fig 2b).

Case Report 3

A 45-year-old female presented with complaints of diminution of vision along with central scotoma and metamorphopsia in both eyes. Her best corrected visual acuity was 6/18 in the right eye and 6/12 in left eye. Anterior segments of both the eyes were normal. Fundus examination revealed multiple colloid bodies in the right eye with suspicious CNV. In the left eye, a large (5-6 DD) haemorrhagic detachment of retinal pigment epithelium in the posterior pole was seen. Fluorescein angiography confirmed the findings of pigment epithelial detachment in the left eye (Fig 3a) and picked up an ill-defined CNV in the right eye (Fig 3b). There was no hot-spot picked up within the pigment epithelial detachment. She was taken up for laser photocoagulation in the right eye. Using 100 microns spot

Fig. 2a : Well-defined classical extrafoveal choroidal neovascular membrane (pre laser - Case 2)

Fig. 2b : After laser treatment with continuous beam argon laser

size, power of 180 mW and a continuous mode the entire CNV in the right eye was ablated. Follow-up evaluation after 3 weeks revealed that the visual acuity in the right eye had improved to 6/9 with fluorescein angiography showing an adequately treated CNV (Fig 3c).

Discussion

That laser is of proven value in CNV of AMD is now well established and that too in well defined extrafoveal lesions. Among the treatment groups, persistence and recurrence of CNV after initial treatment with laser photocoagulation are the major contributors of deterioration [4]. Persistent CNV is defined as leakage detected during the first 6 weeks after laser treatment and recurrence is the leakage detected for the first time 6 weeks and more after laser treatment.

For an adequate laser therapy of CNV the boundaries have to be well-defined, no area of its

Fig. 3a : Large retinal pigment epithelial detachment in the left eye (Case 3)

Fig. 3b : An ill-defined choroidal neovascular membrane in right eye (Case 3)

Fig. 3c : Right eye of the same patient after laser treatment

perimeter should be skipped out and no area is to be missed out. Injury without destruction may stimulate an increased growth of CNV, hence the destruction must be complete [5]. Therefore the protocol in the MPS required a uniformly intense area of whitening. A continuous beam application is less likely to skip any area than would spot burns. Moreover since it is a continuous application the whole treated area is uniformly white than would the case be with interrupted burns.

Another advantage of the continuous beam application is the reduction in the energy levels required to create a coagulum. Whenever the continuous beam is applied the energy level has perforce to be reduced sometimes even to half the level required for a spot burn. This leads to an overall reduction in the energy delivered to the tissue which is of great importance when working in the macular area.

Above all, the advantage of long duration treatment (continuous beam) is a large range of safe power between the level that coagulates CNV and the level that perforates the Bruch's membrane or causes choroidal haemorrhage [6]. Based on our experience, we recommend a trial of using our technique of continuous beam argon-green laser in a large sample of extrafoveal CNV secondary to AMD.

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