LASER INTERVENTION IN MACULAR OEDEMA DUE TO BRANCH RETINAL VEIN OCCLUSION

Col PK SAHOO*, Lt Col VS GURUNADH⁺,
Lt Col JKS PARIHAR[#], Lt Col AP KAMATH^{**},
Wg Cdr JB SINGH⁺⁺

Abstract

20 out of 25 patients of Branch Retinal Vein Occlusion (BRVO), with macular oedema of more than six months duration and less than one year, with visual acuity (VA) less than 6/18 corrected and without retinal neovascularisation (NVE) or capillary non-perfusion (CNP) were subjected to argon-green laser photocoagulation applied in a macular grid fashion. At the end of two years 14/20 (70%) laser treated eyes in comparison to 2/5 (40%) of the non-laser group had corrected visual acuity of 6/12.

MJAFI 2001; 57 : 275-276

KEY WORDS : Branch Retinal Vein Occlusion (BRVO); Laser; Macular grid; Macular oedema.

Introduction

Branch Retinal Vein Occlusion (BRVO) causes an obstruction to venous return of the drainage area resulting in stagnation and abnormality of the microcirculation of that area. However, in contrast to diabetic retinopathy wherein there is a continued progressive abnormality of the same that may involve the entire microcirculation, BRVO is an unfortunate single episode of disaster which is non progressive with sectorial distribution [1-3]. Nature tries to stabilise the microcirculation by establishing collaterals, hence the prognosis is good. In macular oedema secondary to BRVO, a prolonged stagnation of fluid in the region leads to irreversible damage to foveal neurons. Intervention by laser photocoagulation helps early amelioration of macular oedema leading to better and quicker recovery of visual acuity.

Material and Methods

Non-diabetic, non-inflammatory cases of BRVO with a duration of more than six months but not less than 1 year were taken up for the study. Those cases where the haemorrhages had cleared up but with unimprovable VA of 6/18 or less, were then evaluated by fluorescein angiography for evidence of macular oedema (Fig-1)[4]. Cases having NVE or capillary non-perfusion (CNP) of >5 disc dioptries (DD) or macular non-perfusion were excluded from the study. These cases of macular oedema were then either subjected to laser surgery or managed conservatively. Laser surgery consisted of the application of a grid laser in the macular area. This consisted of the application of photocoagulating burns in a 'C' shaped manner temporal to the macula. The burns were given in two rows. The coagulation extended no closer than the foveal avascular zone and no farther than the major vascular arcade. The spot sizes were 50 microns of 0.1 sec duration with power enough to produce moderate intensity white burns. The spots were applied

one spot apart. The total number of spots varied from 50 to 130 depending upon the case. All the cases, laser or non laser were followed up with assessment of VA and fundus examination every fortnight for 12 weeks when fluorescein angiography was updated (Fig-2). Those laser cases showing inadequate resolution were taken up for laser strengthening. Thereafter the cases were reviewed every three months for a period of 2 years from the time of enrolment. Cases lost to follow up were excluded from the study. At the end of two years there were 20 cases in the laser treated group and 5 in the other with a total of 25 cases.

Results

The mean visual acuity of the total study cases at the time of enrolment was 6/24 and the mean duration was eight months. Of the 25 cases, 21 (84%) were of supero-temporal BRVO with 17 being in the laser group and 4 in the non-laser. Of the 4 infero-temporal BRVO, 3 were in the laser group.

Of the 20 laser treated patients 14 cases (70%) had a VA of 6/12 or more at 12 weeks post-laser (Table-1), whereas of the 5 cases of non-laser group only 2 patients (40%) had VA of 6/18 at

Fig. 1 : Fundus fluorescein angiography showing macular oedema in a case of supero-temporal branch retinal vein occlusion in the right eye.

*Professor and Head, Department of Ophthalmology, ^{***}Reader, Department of Ophthalmology, Armed Forces Medical College, Pune - 411 040. ⁺⁺Classified Specialist, (Ophthalmology) Army Hospital (R&R), Delhi Cantt.

the end of 24 weeks (Table-2) (one of these was a case of supero-temporal BRVO and the other of infero-temporal BRVO). In short, laser group had better and quicker recovery. Though CNP area of >5 DD were excluded from the study, none of these patients showed any complication in the affected sector during two years follow up.

TABLE 1
Pre and post treatment visual acuity (laser group)

Visual Acuity	No. of patients	
	Prelaser	Postlaser
Less than 6/60	3 (15%)	—
6/60 - 6/36	6 (30%)	2 (10%)
6/24 - 6/18	11 (55%)	4 (20%)
6/12 or better	—	14 (70%)

TABLE 2
Pre and post treatment visual acuity (non laser group)

Visual Acuity	No. of patients	
	Prelaser	Postlaser
Less than 6/60	3 (60%)	—
6/60 - 6/36	2 (40%)	3 (60%)
6/24 - 6/18	—	2 (40%)
6/12 or better	—	—

Discussion

The crux of the problem in BRVO is whether to treat the attendant macular oedema when it is known that the same resolves naturally. The present study proves the point that laser intervention has a quicker and better recovery. Infact, the better results of laser intervention had made it difficult to observe patients without the same, thus reducing the number of patients in the non-laser group. Since it takes six months for the haemorrhages to clear and since laser has no effect on macular oedema after one year [2], patients with BRVO less than six months and more than an year were excluded from the study. The present study has been almost similar to the BRVO study group except

Fig. 2 : Fundus fluorescein angiography of the same patient after laser photocoagulation showing no leaks

for the fact that the mean follow-up period has been 2 years compared to 3.1 years in the study group and the latter had used blue-green while this study had used argon-green.

Properly evaluated cases of macular oedema due to BRVO fare better with laser intervention given in a grid fashion. This is especially so when the affection is of the supero-temporal vein.

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