

Late-stage diffuse unilateral subacute neuroretinitis: photocoagulation of the worm does not improve the visual acuity of affected patients

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Abstract

Background and objective: To evaluate the visual outcome following direct laser photocoagulation of the worm in patients with late-stage diffuse unilateral subacute neuroretinitis (DUSN). **Patients and methods:** The study reports on 22 DUSN patients diagnosed in its late stage, in whom the worm was identified and subsequently destroyed by laser photocoagulation. Information gathered included initial and final visual acuities and length of follow-up. Statistical analysis was performed with the Paired Student's *t*-Test. A *p* value of less than 0.05 was considered significant. **Results:** After a mean follow-up of 13.1 months, visual acuity improved in 2 patients, remained unchanged in 19 patients and decreased in one patient. Comparison of the visual outcome before and after laser treatment was not statistically significant (*p*=0.302). **Conclusion:** Destruction of the worm by laser photocoagulation in eyes with late-stage DUSN does not improve the visual acuity of affected patients.

Introduction

Diffuse unilateral subacute neuroretinitis (DUSN), initially described by Gass and Olsen [1], is a clinical syndrome caused by a subretinal nematode. Encountered principally in children and young adults, it affects one or, occasionally, both eyes and usually results in severe loss of vision [1, 2].

Diffuse unilateral subacute neuroretinitis has two distinct stages. The early stage manifests inflammatory signs such as vitritis, papillitis, retinal vasculitis, and recurrent crops of evanescent gray-white outer retinal lesions. The late stage is characterized by progressive visual loss, optic atrophy, retinal vessel narrowing, and focal or diffuse RPE degeneration [1].

It has been observed that the destruction of the worm with laser photocoagulation shortly after

the beginning of ocular symptoms prevents additional visual loss and can result in improved vision [1]. However, there is as yet, no study demonstrating whether photocoagulation of the worm may improve the visual acuity (VA) of patients with DUSN in its late stages.

In this report, we evaluated the visual outcome of 22 patients with late-stage DUSN, in whom the worm was identified and destroyed by photocoagulation.

Patients and methods

Medical history review was performed for all patients attended to the Uveitis Clinic, Department of Ophthalmology, Federal University of Rio Grande do Norte, Natal, Brazil, between January

2001 and January 2003. Seventy patients with DUSN were identified. Of these, the worm was discovered in only 22 patients who had been diagnosed as late-stage DUSN and, as a result, these 22 patients were enrolled in the study (Figure 1). Four patients with early-stage DUSN and 44 patients with late-stage DUSN, in whom the worm was not found, were not included in the study.

The 22 patients with late-stage DUSN underwent Snellen VA testing, slit-lamp examination, and fundus examination with indirect ophthalmoscopy and 78 – diopter Volk lens.

All patients were submitted to argon laser treatment under topical anesthesia via a dilated pupil. A Goldman three-mirror lens was used to focus the laser beam onto the retina. The spot size varied from 200 to 300 μm . Exposure time of 0.2 s at power settings ranging from 150 to 200 mW was employed. The worm was covered with confluent laser spots until the exposed area appeared whitish.

Neither systemic nor topical medications were prescribed following laser treatment. A follow-up examination occurred 48 h, 1 week, 2 weeks,

1 month and every 2 months after photocoagulation.

The average VA was determined using the logMAR scale. Statistical analysis was performed with the Paired Student's *t*-Test. A *p* value of less than 0.05 was considered significant.

Results

Clinical data and treatment results are shown in Table 1. Of the 22 patients 12 were men and 10 were women, with a mean age of 15.7 years (ranging from 5 to 37 years) at perception of visual loss. The 22 patients had unilateral disease and all presented narrowing vessels, optic disc pallor and focal or diffuse changes in the RPE. All fellow eyes were normal.

Eighteen patients had initial VA worse 20/200. Two patients had VA equal to 20/200 and the other 2 cases had VA of 20/40 or better (Table 1).

The worm was located in all patients. In 7 patients it was found in the posterior pole; in 6

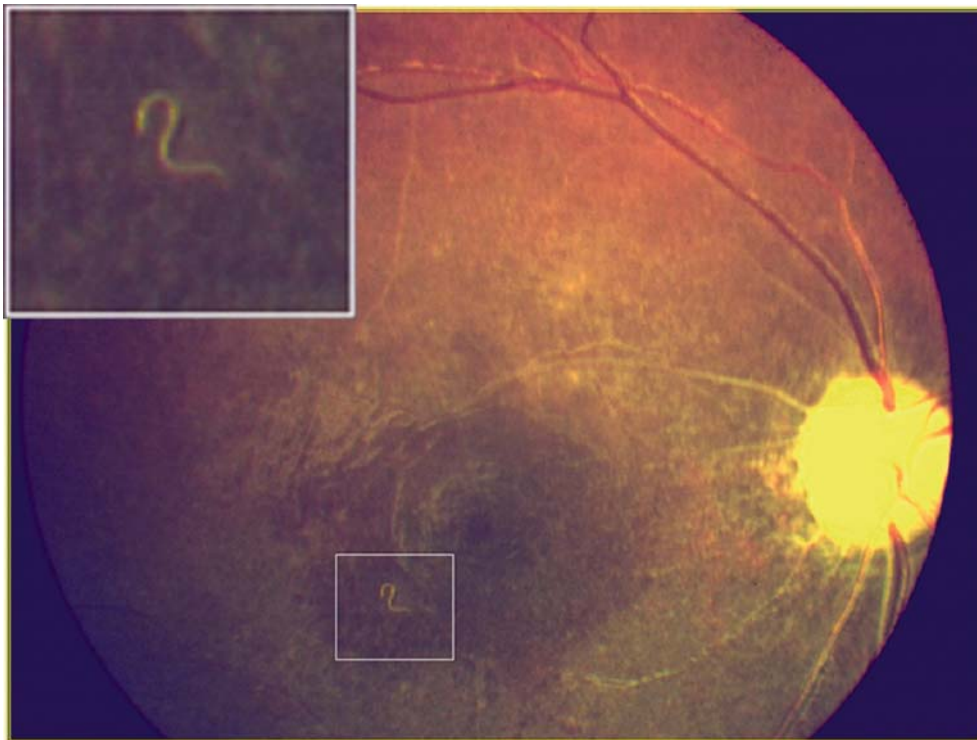


Figure 1. Late-stage DUSN. Note the optic atrophy, narrowing of the retinal arteries, and widespread mottled depigmentation of the RPE. The subretinal worm was located (detail).

Table 1. Clinical data of patients with late-stage DUSN

Patient No.	Sex	Age (years)	Affected eye	Δt (months)	Initial VA (Snellen)	Follow-up (months)	Final VA (Snellen)
1	M	14	Left	3	20/800	24	20/200
2	M	8	Right	10	20/800	23	20/800
3	M	19	Right	9	20/800	22	20/800
4	M	19	Left	36	20/800	21	20/800
5	M	22	Right	48	20/800	20	20/800
6	M	13	Left	6	20/800	18	20/800
7	F	21	Left	3	20/800	18	20/800
8	M	23	Right	3	20/40	16	20/40
9	F	21	Right	11	20/200	15	20/60
10	M	37	Right	12	20/30	13	20/25
11	F	12	Left	36	20/800	12	20/800
12	M	14	Right	12	20/400	12	20/400
13	M	16	Left	12	20/800	11	20/800
14	M	11	Left	14	20/800	11	20/800
15	F	8	Left	10	20/800	11	20/800
16	F	12	Right	10	20/200	10	20/200
17	F	5	Right	12	20/400	10	20/400
18	F	9	Right	3	20/800	8	20/800
19	F	16	Left	4	20/800	6	20/800
20	F	15	Left	13	20/800	3	20/800
21	F	16	Left	1	20/800	3	20/800
22	M	14	Left	8	20/800	2	20/800

Δt – Time from perception of visual loss to laser photocoagulation; VA – visual acuity; M – male; F – female.

patients it was located temporal-inferiorly; in 4 patients it was found superior temporal. Three worms were located nasally to the optic disc and two were found in the retinal periphery.

After a mean follow-up interval of 13.1 months post-laser (ranging from 2 to 24 months), only patient 5 showed a decrease in VA. Patients 1 and 9 showed an improvement of vision. However, in 19 patients the VA remained unchanged (Table 1).

The mean logMAR visual acuity before laser treatment was 1.41 (approximately 20/500), and post-laser treatment was 1.37 (approximately 20/460). This difference was not statistically significant ($p=0.302$).

Apart from the round hyperpigmented retinal scar located in the photocoagulated area, ophthalmoscopy of these eyes showed no difference from the previous picture seen before laser treatment.

Discussion

The pathogenesis of DUSN appears to involve a local toxic tissue effect on the outer retina caused

by the worm by-products left behind, as well as a more diffuse toxic reaction affecting both inner and outer retinal tissues [1].

It has been suggested that early diagnosis of DUSN and subsequent location and destruction of the worm by photocoagulation may prevent the loss of vision in affected eyes [1]. However, most patients in South America come to be examined in very late stages of the disease, presenting ophthalmoscopic features such as optic disc atrophy, narrowing of the retinal arteries, focal and diffuse degenerative changes in the RPE, and severe permanent loss of vision. In our series of 70 patients with DUSN from an endemic area in Northeastern Brazil, 4 patients were diagnosed in the early-stage DUSN and 66 patients were diagnosed in the late stage of this disease. However, in only 22 of these 66 patients, the worm was found. Due to its characteristic findings, the diagnosis of late-stage DUSN is straightforward, mainly if the patient comes from endemic areas. In fact, the most difficult task is not the diagnosis but to locate the worm in the retina, which is laborious and time consuming, often requiring many visits. This can

delay the treatment and compromise the visual prognosis.

Some papers presenting cases with late-stage DUSN showed no visual improvement after destruction of the worm [3–8]. However, most of these papers were single case reports [3, 5, 7, 8]. In the present article we report on 22 patients with late-stage DUSN, in which the worm was located and destroyed in all cases. After a mean follow-up of 13.1 months VA decreased in one patient, improved in only 2 patients and remained stable in 19 after laser treatment. This supports Gass' observation that VA often does not improve after photocoagulation unless the worm is killed soon after onset of visual loss [1]. This was clearly observed in our series. Of 9 patients with 12 or more months from the perception of visual loss to treatment, none improved vision after laser therapy.

Our series, the largest reported to date, confirms the relative inefficiency of laser treatment to improve vision of patients with late-stage DUSN. However, we believe that every patient with this disease must be carefully evaluated in order to have the worm located and destroyed by laser, since this approach may avoid further visual loss.

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