LASER TREATMENT OF CENTRAL SEROUS CHORIORETINOPATHY, OF PIGMENT EPITHELIAL DETACHMENTS AND OF SUBRETINAL NEOVASCULARIZATIONS IN SENILE DISCIFORM MACULAR DEGENERATION

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SAMENVATTING

Uit de literatuur blijkt dat argon lasercoagulatie van de lekkageplaats bij chorioretinopathia centralis serosa sneller de vochtblaas doet verdwijnen dan wanneer niet behandeld wordt, maar niet tot een betere visus leidt. De gevaren daarentegen zijn het opwekken van subretinale neovasculaire membranen en het creëëren van een laserscototoom, naast de gebruikelijke risico's aan lasercoagulatie verbonden.

In een prospectief onderzoek bleek dat in onze handen bij een pigmentepitheeloslating en bij subretinale nieuwgevormde vaten als voorstadium van een seniele disciforme maculadegeneratie (Junius Kuhnt) de gezichtsscherpte in ogen met argon laserbehandeling sneller daalde dan in onbehandelde ogen.

RÉSUMÉ

D’après les données de la littérature la photocoagulation au laser à l’argon du point de fuite de la chorioretinite séreuse centrale fait disparaître la bulle de liquide plus rapidement qu’en l’absence de traitement, mais ne conduit pas à une meilleure vision. D’autre part, le traitement peut provoquer l’apparition de membranes de néovascularisation sous-rétiniennes et créer un scotome en plus des risques habituels inhérents à la photocoagulation au laser.

Une étude prospective montre que, dans notre matériel personnel de détachement de l’épithélium pigmentaire et de vaisseaux néoformés sous-rétiniens en tant que stades précoce de la dégénérescence maculaire sénile de Junius-Kuhnt, le traitement au laser à l’argon fait baisser l’acuité visuelle plus vite que dans les yeux non traités.

SUMMARY

In central serous chorioretinopathy argon laser treatment of the leaking spot leads to faster disappearance of the detachment but not to better final visual acuity in comparison with untreated eyes. Laser treatment on the other hand may stimulate subretinal neovascular vessel growth and may result in a small scotoma, apart from the more well-known hazards of light coagulation.

We found in a prospective, randomized study that argon laser coagulation of pigment epithelial detachments and subretinal neovascular membranes as early stages of senile disciform macular degeneration (Junius-Kuhnt) caused a more rapid impairment of visual acuity than no treatment.

*Mots-clés*: Photocoagulation, Laser à l'argon, Choriorétinopathie sèreuse centrale, Décollement de l'épithélium pigmentaire, Dégénérescence maculaire sénile.

*Central serous chorioretinopathy*

In treatment of central serous retinopathy or choriopathy the important thing is to decide first what is the aim of treatment. Is it to relieve the patient of his/her complaints of blurred vision, which are often the consequence of several dioptries of hypermetropia, or to alleviate the metamorphopsia? Or are we aiming to improve the final visual acuity, to achieve this visual acuity earlier than would be the case without treatment, or to reduce the likelihood of recurrence?

To get an idea of the value of laser treatment we may first look at the natural history of central serous retinopathy. Nanjiani (1977) examined the visual acuity of untreated patients 2 to 8 years after their first attendance at the eye clinic. Of the 113 patients only 48% responded to an invitation to attend for reexamination. In this group of untreated patients 96.5% had a visual acuity equal to or better than 0.5 after 2 to 8 years. Fifteen patients had been treated with corticosteroids and their visual acuity was no better than that of the untreated patients. Half of the total number of patients had a recurrence. Gass (1977) also reports a favorable prognosis for untreated cases. Watzke (1974) noted that the duration of symptoms, the visual acuity at the time of the first visit, and the patient’s age had no influence on the prognosis of central serous retinopathy.

Leaver and Williams (1979 carried out a prospective study on the effect of laser treatment in 67 patients with central serous retinopathy and a visual acuity of 0.5 or better. These patients were assigned to four groups: older or younger than 40 years and with symptoms dating from
longer or shorter than one month. Three patients failed to return and one developed a subretinal neovascular membrane. In the treated group the symptoms cleared up in a mean of 6.2 weeks and in the untreated group in 16 weeks. After 2 months the visual acuity was significantly better in the treated group, but this difference subsequently disappeared. The investigators were unable to find any significant difference in visual acuity or color vision in the treated group, even when the patients were subdivided according to age, extent of serous detachment, distance from leaking area to fovea or the presence of preexistent affections of the pigment epithelium.

Watzke, in a prospective study with argon laser, showed in 1979 that direct coagulation at the site of leakage led to more rapid improvement than coagulations placed in a semicircle at the lower edge of the blister. The coagulation need only be mild; too intense coagulations, and especially those with a diameter of less than 200 μ are more likely to give rise to subretinal neovascularizations, as described by François et al. (1975) and Schatz et al. (1978). Greite (1975), using an argon laser, showed that coagulations in which the retina does not become white are also effective. Wessing (1973) found, in a nonprospective study, that eyes treated with light coagulation suffered fewer recurrences than untreated eyes.

Summarizing we may conclude that light coagulation of the site of leakage in central serous retinopathy causes the detachment to dry up more rapidly and possibly prevents recurrences, but does not improve the ultimate visual acuity. Against this one must consider the risk of development of subretinal neovascularization and of the persistence of a small laser scotoma, apart from the other risks attending light coagulation. Nevertheless, the various authors who have written on this subject observe the following indications for treatment of central serous retinopathy:

1) visual acuity less than 0.5;
2) duration of symptoms longer than 6 months if the site of leakage is within 1/4 disc diameter from the fovea;
3) permanently impaired vision in the other eye, resulting from a previous central serous retinopathy (in such cases treatment is started after 1 month);
4) occurrence of pathological changes in the retina, e.g. cystoid edema or subretinal exudates;
5) recurrence: in this case treatment should be started after 1 month instead of after 4-6 months;
6) loss of working ability on account of metamorphopsia.

It is perhaps superfluous to point out that most of these general principles are based on experience and not on investigations.

*Pigment epithelial detachments and senile disciform macular degeneration*

The first publication dealing with light coagulation (Watzke, 1968) was followed by several other reports on a favorable effect. Lewis (1978) and Meredith et al. (1979) have also drawn attention to the favorable natural course in patients younger than 56 years. No prospective, aselect investigation of the effect of argon laser coagulation in senile disciform macular degeneration of Junius Kuhnt had yet been undertaken, and this led us to start such an investigation in 1976. Patients with media opacities impeding fluorescein angiography, patients with whom kinetic and static perimetry failed and patients with diabetic retinopathy, central serous retinopathy, profound amblyopia or subretinal neovascularizations not attributable to a prestage of Junius Kuhnt disease (criteria requiring presence of drusen in the posterior pole) were excluded from the study.

*Pigment epithelial detachments*

Only patients aged between 40 and 80 years with a detachment of pigment epithelium were included in the study. Criteria for treatment were that the detachment must have been present for more than 6 weeks and must be larger than one disc diameter measured on the angiogram. When it had been decided that the case complied with the conditions for treatment, the decision whether or not the patient was to be treated was made at random. After coagulation we used angiograms and funduscoppy to decide whether further treatment was possible or necessary. Visual field determination under mesopic conditions was of use in showing an increase or decrease of edema, but was not used as indicator for light coagulation.

In a period of 4 years we have seen only a total of 13 treatable cases of pigment epithelial detachment. Six of these underwent coagulation and seven did not. The follow-up was 1-3 years, mean 2 years and 2 months. Figure 1 shows the course of the vision of 6 treated and 7 untreated eyes. All the pigment epithelial detachments had dried up within the follow-up period. The course of the visual acuity was more variable in the untreated than in the treated cases. Figure 1 shows that
Fig. 1. — Visual acuity of 7 untreated eyes (left) and 6 argon laser coagulated eyes (right) with pigment epithelial detachment.

5 treated eyes had a vision of less than 0.2 after one year and that only 2 of the untreated eyes achieved this level of acuity. In 3 of the treated eyes a neovascular membrane developed, while 5 of the 7 untreated eyes acquired a subretinal neovascular membrane after 3-18 months.

Subretinal neovascular membrane

There were also 13 eyes with this affection which fulfilled the conditions for laser coagulation. Seven of these were treated and 6 not. Figure 2 shows the course of visual acuity in both groups. After one year 6
of the coagulation-treated eyes had a vision of less than 0.1; only 2 of the untreated eyes reached the same level.

In view of the results of this study we concluded that laser coagulation of pigment epithelial detachments and of subretinal neovascular membranes, as prestages of Junius Kuhnt disease, is of no use, at any rate in this set-up. A difficulty in judging the results is that the number of patients on which the conclusions are based is much smaller than we had expected.

An identical investigation on the treatment of pigment epithelial detachments and subretinal neovascularizations is now in progress at Moorfields Eye Hospital (Bird et al., 1981). Among several thousand patients there were 49 eyes with a pigment epithelial detachment fulfilling the criteria for treatment. After 16 months the treated group had about the same visual acuity as the untreated, but the vision had decreased much more rapidly in the treated eyes. After reanalysis of the original angiograms it appeared that about half of these had not been correctly judged with regard to the presence of subretinal neovascular membranes in the treated patients. Doubtless this was also the case with some of our patients; it remains very difficult to rule out the possibility that a subretinal neovascular membrane is present under a detachment of the pigment epithelium.

Subdivision of patients into groups of 50-60 years and 60-80 years, or eyes with visus greater or less than 1/6 at the first visit, or edge of detachment more or less than 200 μ distant from the fovea failed to reveal any difference in effect of treatment. The conclusion of the Moorfields Macular Study Group was also that argon laser coagulation does not have any favorable effect on pigment epithelial detachments. As to the value of the treatment for subretinal neovascular membranes the group has not yet been able to reach a conclusion.

A few publications have appeared in which it is stated that the crypton laser is better than the argon laser for treatment of subretinal vascular membranes in the vicinity of the fovea because less energy is absorbed in the macular pigment (Bird, 1979). As yet, however, there are not enough data available.

Summarizing we thus find that argon laser coagulation of pigment epithelial detachments results in more rapid impairment of vision than occurs when such eyes are left untreated. The same applies, in our experience, to subretinal neovascular membranes. It is possible that treatment of these neovascular membranes may be of use if still stricter criteria of selection are used, e.g. visual acuity better than 0.5 and edge
of membrane more than 1500 μ away from the fovea. Until more light has been shed on these matters the treatment with argon laser must remain limited to highly specialized centres, both as regards interpretation of fluorescein angiograms and as regards treatment. These centres will then be required to show, in a properly designed and executed study, that, if certain selection criteria are adhered to, the treatment of subretinal vascular membranes as prestage of Junius Kuhnt disease is in fact effective. Until that time argon laser coagulation remains in an experimental stage.

BIBLIOGRAPHY


