



SESSION: Subthreshold laser

DATE: September 3, 2023

HALL: HALL 1

TIME: 08.30-09.00

Moderator: Barbara Parolini

Micropulse laser for the treatment of subretinal fluid - Barbara Parolini

Micropulse subthreshold yellow laser in the treatment of central macular edema in central serous chorioretinopathy

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Purpose: One of the major causes of CME is disruption of the blood-retinal barrier. Subthreshold micropulse yellow laser (SMYL) has widespread benefits for the treatment of different macular disorders, including CME without foveal damage. We report a series of cases of CME that were completely resolved with the SMYL treatment.

Materials-Methods: The results of 18 eyes with central serous chorioretinopathy (CSHR) treated with yellow laser micropulse laser photocoagulation are presented. CSHR was diagnosed in all eyes at the first examination, confirmed by fluorescein angiography (FA) and OCT maculae. Laser intervention was performed according to the results of FA. The results were measured according to visual acuity (Snellen tables), the central thickness of the macula was monitored by OCT maculae and at the last control a FA was performed. Results from the first visit, 15 and 30 days after the intervention were compared. The results are presented using the Microsoft Excel program.

Results: The results obtained indicate a complete cure of CME caused by CSHR by SMPL performed according to FA. According to the last FA report, there was a complete regression of CME, which is confirmed by the central thickness of the macula reduced by an average of 51% and the visual acuity improved by at least 3 lines and reaches 1.0 in all cases. A greater effect of the intervention was seen at the first control, while complete regression occurred at the second control, 30 days after the intervention.

Conclusion: Based on the presented results, it is concluded that subthreshold

micropulse yellow laser intervention is a reliable method of treating CME caused by CSHR. OCT results of the macula and visual acuity indicate a complete regression of the disease within 30 days of the intervention.

Keywords: Central serous chorioretinopathy, subthreshold micropulse laser

5-year prospective RCT comparing micropulse with 1/2dose PDT

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Both photodynamic therapy (PDT) and subthreshold micropulse laser therapy (SMLT) have been previously used to treat CSCR, but their anatomical and functional outcomes have not been compared. This study aimed to compare the efficacy of half-dose PDT and yellow 577nm subthreshold micropulse laser (SMLT) in treating patients with chronic CSCR.

A prospective, double-masked, randomized controlled clinical trial was conducted on 68 patients with chronic CSCR confirmed by clinical features and multimodal imaging. Eligible patients were randomized to receive half-dose PDT or SMLT. The same treatment was repeated if persistent subretinal fluid (SRF) was observed. Treatment responses were evaluated 1 month after treatment and every 3 months until the endpoint at 12 months.

The primary outcome measure was the complete resolution of subretinal fluid on optical coherence tomography (OCT) scan. Secondary outcomes included the changes in best-corrected visual acuity (BCVA), central macular thickness (CMT) as measured by OCT, retinal sensitivity as measured by microperimetry, and vision-related quality of life using the National Eye Institute 25-Item Visual Function Questionnaire.

At one month after treatment, SRF resolved in 8/33 (24.2%) patients receiving SMLT and 20/34 (58.8%) patients receiving half-dose PDT. This increased to 23/28 (82.1%) in the SMLT group and 30/33 (90.9%) in the half-dose PDT group at 12 months of follow-up. Kaplan-Meier survival curves showed significantly faster resolution of SRF in the half-dose PDT group than SMLT group ($p=0.016$). Both groups showed significant improvement in BCVA, CMT, and retinal sensitivity at 12 months compared with baseline. There was no significant difference between the two treatment groups at each time point in all investigations except BCVA at 3 months.

In conclusion, half-dose PDT and subthreshold SMLT are both effective in treating chronic CSCR, with half-dose PDT achieving faster anatomical success and functional improvement.

Keywords: half-dose photodynamic therapy, Subthreshold micropulse laser, Central serous chorioretinopathy

Central Serous ChorioRetinopathy treated with subthreshold 3 ns laser: A retrospective case series

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Purpose: To test the hypothesis that selective RPE treatment by focal subthreshold 3ns laser can achieve resolution of symptomatic CSCR in a consecutive case series.

Setting: All patients were managed by one retinal specialist (WJH) at Retinology Institute. Written consent was obtained and the audit approved by the HREC of La Trobe University, Victoria, Australia.

Methods: All patients fulfilled the major diagnostic criteria of CSCR. After detailed informed consent, 2-4 threshold determining spots of the 3 ns laser (2RT® AlphaRet) were applied near a major arcade and then the leaking focus directly treated at subthreshold power. Patients were reviewed at 6 and 12 weeks. Data Analysis was with IBM SPSS Version 27 software.

Results: Of the 86 eyes, 72 (84%) had elimination of subretinal fluid (SRF) after a mean of 42.36 days. 15 were retreated; 11 with focal alone, 4 with supplemental grid. Complete resolution at 3m occurred in 93% of eyes. No complications occurred.

Conclusions: These findings support the original hypothesis that limited RPE specific treatment alone can resolve active CSC in the majority of cases, while avoiding treating otherwise well-functioning RPE. An interventional randomised study with the Centre for Eye Research Australia (CERA), has commenced.

Keywords: CSCR, nanosecond, Laser

Subthreshold stimulation laser in central serous chorioretinopathy

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While the central serous chorioretinopathy (CSC) can easily be treated with laser when a focus of leakage can be defined, treatment of CSC without visible focus, i.e. with multiple or diffuse leakage is difficult. Half dose PDT used to be tried for twenty years with limited success but neither Visudyne nor the special lasers are available now. Instead, different types of micropulse lasers are used nowadays.

Having no micropulse laser, since twenty years ago we have been using a standard laser in a modified way. Subthreshold laser power with a small diameter spot and shorter time does not cause laser burns but presumably it rather stimulates the RPE which then either seals the area of leakage or improves the reabsorption of fluid. The results of our small study are showing that this method brings success comparable to the classical focal laser of the well-defined focus. We are using this technique also in diabetic macular edema and in idiopathic perifoveal teleangiectasia.

Take home message: Subthreshold laser treatment can be performed even without special lasers, just using a standard laser machine.