

## Should PASCAL laser replace conventional laser for the treatment of macular edema and ischemic retinopathies ?

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### Advantages:

The Pattern Scanning Laser (Pascal) is a new semi-automatic photocoagulator using short pulses of 10 to 20 milliseconds applied in square (2X2 to 5X5 impacts) or grid (14 to 56 impacts) patterns.

### Methods:

We evaluated Pascal laser efficacy and safety for the treatment of macular edema (ME) in 15 eyes and ischemic retinopathy in retinal venous occlusions and proliferative diabetic retinopathy in 20 eyes. Focal 1 impact, 2x2 and grid patterns were used for ME whereas 4X4 and 5X5 patterns of impacts were used for panretinal photocoagulation (PRP). Ten control eyes with ME and ischemic retinopathies were treated with conventional green laser. ETDRS visual acuity, macular Spectralis<sup>®</sup> OCT (SOCT) and fluorescein angiography (FA) were performed before and 3 to 6 months after treatment.

### Effectiveness / Safety:

Pascal laser focal and grid 10ms impacts induced a decrease in ME. S-OCT analysis showed localized defect at the junction of the inner/outer segments of the photoreceptors and retinal pigment epithelium. Conventional laser grid treatment induced hyperreflective burns reaching the outer nuclear layer. Compared to conventional laser, macular 10ms and PRP 20ms burns did not enlarge at 6 months followup on FA. One to 3 sessions with Pascal laser compared to 4 to 6 sessions with conventional laser were necessary to achieve complete PRP and regression of new vessels. PRP with Pascal induced pain in 10% compared with 50% of eyes treated with conventional laser.

### Take home message:

Compared with conventional laser, Pascal laser treatment for PRP shortens the number and duration of laser sessions. Pascal's 20 ms impacts decrease pain, and enlargement of laser scars. For macular grid, Pascal laser enables a precise and safe treatment with reduced thermal damage of the outer retina.