Use of three-dimensional digital image analysis for objective evaluation of the efficacy of port-wine stain treatment with large spot 532 nm laser over prolonged period time

**Abstract**

**Introduction**: Port-wine stains (PWS) are a common type of cutaneous capillary malformations that affect 0.3% of newborns. The previous studies have shown the efficacy of PWS treatment with large spot 532 nm laser, with median maximal improvement achieved during treatment (GCEmax) ranging from 50% to 70%.

**Aim**: To assess the efficacy of PWS treatment with the use of a large spot 532 nm laser over a prolonged period of time.

**Material and methods**: Sixty-four Caucasian patients aged 6 to 59 were included in this study. Patients had 3D photography performed before and after treatment with a 532 nm Nd:YAG laser with large spot and contact cooling. An objective analysis of percentage improvement based on a 3D digital assessment of combined colour and area improvement (global clearance effect [GCE]) were performed.

**Results:** The median maximal improvement achieved during the treatment (GCEmax) was 42.4%. The first two laser procedures had a median maximal improvement of 25.4% (GCE25.4), while the first 5,10,15 and 20 laser procedures had respectively 31.31%, 38.09%, 40.44% and 40.55% total maximal improvements. The procedures have been divided into time groups, based on time passed in-between procedures, and the relation between time-group and negative relative clearance has been found.

**Conclusions**: Analysis indicates that large spot 532 nm laser is highly effective in the treatment of PWS. Further analysis proofs the first two laser procedures have higher efficacy and improvements start plateauing around 10th visit. The established correlation between the time group and the efficacy of treatment could be explained by the exacerbating of PWS over time, indicating further bi-yearly treatment is needed to sustain healing.

**Keywords**: port-wine stain, KTP, pulse dye laser, laser.