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Case Report

Two-session treatment of facial solar lentigines with a 785-nm picosecond laser: a case report

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ABSTRACT

Published 785-nm picosecond laser protocols for facial pigmentation have used different combinations of fractional and non-fractional handpieces. We describe the photographic course of a 71-year-old woman with Fitzpatrick skin type II and clinically diagnosed facial solar lentigines after two non-fractional treatments 30 days apart. The first session used a 785 Collimator handpiece with a 7×7 mm spot, 0.4 J/cm², 196 mJ per pulse, 6 Hz, and a recorded count of 660 pulses. The second used a 785 Zoom handpiece with a 4×4-mm spot, 1.0 J/cm², 160 mJ per pulse, 6 Hz, and 500 clinician-reported pulses. Photographs were available 147 days before treatment and 14 days after each session. The final photograph showed visible lightening of the darker cheek lesions, with residual pigmentation. The clinician reported dark brown to dark red discoloration after treatment; this discoloration lasted 4-5 days before fading. Differences in illumination and positioning and the remote baseline precluded reliable quantification or attribution of the observed change. This case documents nominal device settings and a short-term photographic course after a collimator-to-zoom sequence. It does not establish the superiority of this sequence, an optimal treatment interval, or durable clearance.

Keywords: Solar lentigines, Lentigo solaris, Picosecond laser, 785 nm, Pigmentation, Case report

INTRODUCTION

Selective absorption of short laser pulses provides the physical basis for treating cutaneous pigment while limiting injury to surrounding structures.[1] Clinical reports of 785-nm picosecond treatment have included freckles, lentigines, and melasma, but these diagnoses and their treatment protocols should not be treated as interchangeable. The most relevant reports on the HELIOS platform used fractional treatment alone or in combination with a non-fractional handpiece.[2,3]

We report facial solar lentigines in a patient with Fitzpatrick skin type II treated with a non-fractional collimator handpiece and, 30 days later, a non-fractional zoom handpiece. The case is presented to document the treatment sequence, the spot-fluence-energy relationship, and the early photographic outcome, rather than to propose a new standard regimen.

CASE REPORT

A 71-year-old woman with Fitzpatrick skin type II presented with facial solar lentigines. The baseline photograph, taken on 7 April, showed multiple light-to-dark brown macules and patches on the lateral cheek, including two more conspicuous darker areas within a background of mottled pigmentation (Figure 1a). It preceded the first treatment by 147 days and was not an immediate pretreatment photograph. The treating clinician made the diagnosis of solar lentigines; details of dermoscopic assessment or histological confirmation were not available in the documentation reviewed for this report.

Two sessions were performed with a HELIOS 785 laser platform (Intros Medical Laser, Heilbad Heiligenstadt, Germany and LASEROPTEK, Seongnam, Republic of Korea), with Pico 785 selected for both treatments. Published technical specifications describe a nominal 785-nm pulse duration of 600 ps and distinguish the 785 collimator and 785 zoom handpieces from the fractional Dia FX applicator.[4] This report uses the nominal pulse duration and displayed energies; independent measurement data were not available. The documented settings are summarized in Table 1 and illustrated in Figure 2.

Table 1: Treatment timeline and documented laser settings.

Parameter	Session 1	Session 2
Treatment date/time from first session	01 September/ day 0	01 October/ day 30
Device/selected mode	HELIOS 785/Pico 785	HELIOS 785/Pico 785
Wavelength (nm)	785	785
Nominal pulse duration (ps)[a]	600	600
Handpiece	785 Collimator	785 Zoom
Beam delivery	Non-fractional	Non-fractional
Displayed square spot (mm)	7×7	4×4
Fluence (J/cm²)	0.4	1.0
Displayed pulse energy (mJ)	196	160
Repetition rate (Hz)	6	6
Pulse count[b]	660 (device counter)	500 (clinician reported)
Photographic follow-up	15 September: 14 days after session 1	15 October: 14 days after session 2

Baseline photograph: 07 April, 147 days before session 1. Treatment dates were reconstructed from the confirmed photographic dates and the 14-day post-treatment intervals; [a] manufacturer-reported nominal specification, not an independent pulse-duration measurement.[4] [b] the second-session screen photograph shows zero and documents settings only. The reported treatment count was 500 pulses. The first-session screen displays 660. Square dimensions are retained as shown on the device displays. Calculated pulse energies are 0.4×0.49=0.196 J and 1.0×0.16=0.160 J. Pass count, overlap and treated surface area cannot be inferred from these values

The first session was performed on 01 September (day 0) and the second on 01 October (day 30). These dates were reconstructed from the confirmed follow-up dates and the 14-day interval between each treatment and its photograph. At the first session, the 785 collimator was used with a 7×7-mm square spot, a fluence of 0.4 J/cm², a displayed pulse energy of 196 mJ, and a repetition rate of 6 Hz. The recorded device counter was 660. At the second session, the handpiece was changed to the 785 Zoom, with a 4×4 mm square spot, 1.0 J/cm², 160 mJ, and 6 Hz. The treating clinician reported 500 pulses for this session. The photograph of the second-session settings shows a counter of zero; it documents the selected settings, not the final delivered pulse count.



Figure 1: Clinical photographic course of facial solar lentigines, (a) baseline photograph on 07 April, 147 days before the first session; (b) photograph on 15 September, 14 days after the first session; (c) photograph on 15 October, 14 days after the second session and 44 days after the first. The sessions were 30 days apart. Persistent pigmentation is visible in panel B; the darker cheek patches appear lighter in panel C, with residual pigmentation. Illumination, positioning, framing, and eyewear differ across the photographs. The baseline was not obtained immediately before treatment, and no quantitative clearance estimate or treatment-specific effect can be assigned.



Figure 2: Device-display documentation of the treatment settings, (a) first session: 785 Collimator, Pico 785 mode, 7×7 mm, 0.4 J/cm², 196 mJ, 6 Hz; the displayed counter is 660; and (b) second-session settings: 785 Zoom, Pico 785 mode, 4×4 mm, 1.0 J/cm², 160 mJ, 6 Hz. The displayed counter in panel B is zero and must not be interpreted as the delivered pulse count. The treating clinician separately reported 500 pulses for the second session. Both device-display photographs were supplied in color.

The nominal energies are internally consistent with the displayed square spot dimensions: 0.4 J/cm²×0.49 cm² =0.196 J for the first session, and 1.0 J/cm²×0.16 cm² =0.160 J for the second. The second session therefore used a higher fluence but a lower energy per pulse. Neither

pulse count nor spot size establishes the number of passes or the energy received at any individual skin location.

Follow-up photographs were obtained on 15 September (day 14), 14 days after the first session, and on 15 October (day 44), 14 days after the second session (Figure 1). The intersession photograph showed persistent brown lesions. In the final photograph, the darker cheek patches appeared lighter and less distinct from the surrounding skin, although residual brown macules remained. Illumination, camera position, framing, and eyewear differed across the three photographs. The comparison was therefore descriptive; no percentage clearance, validated improvement score, or instrumental pigment measurement was assigned. The intersession image documents the course after the first treatment but does not isolate the incremental effect of the second. No follow-up beyond 14 days after the second session was available for this report.

The treating clinician subsequently reported dark brown to dark red discoloration of the treated areas after the treatments. This discoloration persisted for 4-5 days before fading. Discomfort, crusting, functional limitations, and time to full recovery were not documented. The available information was not used to classify either session as free of adverse effects.

DISCUSSION

The main observation is early lightening of clinically diagnosed solar lentigines after two 785-nm sessions using different non-fractional handpieces. The first used a larger field and lower fluence; the second used a smaller field and higher fluence. This distinction matters because fluence is energy per unit area, not pulse energy. In this case, the increase from 0.4 to 1.0 J/cm² was accompanied by a reduction in displayed pulse energy from 196 to 160 mJ. Describing the second session simply as “higher energy” would therefore be inaccurate.

Clinical improvement after a small number of 785-nm treatments has already been described. Chung et al reported improvement of ephelides after one session in two patients, although ephelides are not equivalent to solar lentigines.[5] Hong et al described three patients with mixed facial pigmentary disorders treated with a 600-ps 785-nm laser. A diffractive optical element handpiece was used in all three cases, with additional focal zoom treatment in two; improvement was reported after three to four sessions.[2] Those results support clinical interest in the wavelength but do not isolate the effect of a non-fractional collimator-to-zoom sequence.

In a subsequent pilot study, Hong et al treated 15 women with Fitzpatrick skin types II-IV using five weekly sessions. Each session combined a fractional 5×5-mm pass at 0.8 J/cm² with a non-fractional 7×7-mm collimator passes at 0.3-0.4 J/cm². Clinical and pigment-index improvements were reported, with follow-up 4 weeks after the final session.[3] The first-session collimator settings in our case overlap with that study, but the complete regimens differ: our documented treatment comprised two non-fractional sessions, separated by 30 days, with a zoom handpiece used at the second visit. It would be inappropriate to infer equivalent effectiveness, a fractional remodeling effect, or a synergistic interaction from this single case.

Spot dimensions also need to be reported in the form actually displayed by the device. For this case, both the 7×7-mm and 4×4-mm values denote square fields, not circular diameters. The square-field interpretation agrees with the displayed pulse energies and with the manufacturer’s technical description.[4] This arithmetic confirms internal consistency of the recorded settings; it does not replace output calibration or establish clinical safety.

The diagnosis remains more important than the choice of wavelength. A pigmented facial lesion should not be regarded as benign merely because it lightens after laser treatment. Delker et al described melanomas diagnosed in previously laser-treated areas, illustrating the risk of delayed diagnosis when a pigmented lesion is incompletely assessed.[6] In practice, an uncertain or atypical lesion requires diagnostic clarification, with histological assessment when indicated, before cosmetic pigment removal. The present report concerns lesions diagnosed clinically as solar lentigines and should not be extrapolated to undiagnosed facial pigmentation.

Several limitations restrict interpretation. The outcome is based on one patient and non-standardized photographs. The baseline photograph was obtained 147 days before the first session, leaving possible intervening changes undocumented. Although an intersession photograph is available, differences in photographic conditions and the absence of a control prevent reliable attribution of the observed change to either treatment or to the change of handpiece. The treatment interval was an observed feature of this case, not an experimentally selected optimum. The available documentation did not allow assessment of pass number, overlap, treated surface area, concurrent skin care, or patient-reported outcomes.

The clinical rationale for changing handpieces was not documented. Post-treatment skin reactions were described retrospectively by the treating clinician, without a structured assessment of symptoms or functional recovery. Follow-up ending 14 days after the second session is insufficient to assess durable clearance, recurrence, or the full course of pigmentary adverse effects. Longer follow-up and standardized photography would be needed before drawing stronger conclusions.

CONCLUSION

Two non-fractional 785-nm picosecond laser sessions, 30 days apart, using a collimator followed by a zoom handpiece were followed by photographic lightening of

facial solar lentigines in a patient with Fitzpatrick skin type II. The remote baseline and non-standardized photographs limit attribution of this change to treatment. The report documents technically consistent nominal settings and residual pigmentation 14 days after the second session; it does not demonstrate superiority over other regimens or establish long-term safety and durability.

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