

# Treatment of Vascular and Pigmented Lesions with Beamax 535nm Hand Piece

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## ABSTRACT

Pulsed Light technology has become a standard tool for the treatment of superficial vascular & pigmented lesions such as: telangiectasia, erythema, rosacea, broken capillaries, poikiloderma, dyschromia, melasma, solar lentigo and mottled pigmentation.

Non-ablative pulsed light treatments are effective for all age groups and all skin types.

This paper reviews key issues that impact directly on the efficacy and safety of this treatment procedure and describes our experience with the new Beamax pulsed light system.

Fifty-eight (58) patients with vascular and pigmented superficial lesions underwent an average of 4.2 treatments, applied every 4 weeks, 2 to 3 sessions for lentigos (age/sun spots) and 4 to 6 sessions for telangiectasia, melasma, rosacea and poikiloderma.

Clearance was noticed in all cases. Mild side effects such as erythema and edema occurred in 12.6 % of the patients but resolved without any medical intervention. Two patients experienced purpura which also resolved spontaneously.

In all these cases the Beamax pulsed light system was applied with the VL/PL 535nm handpiece.

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## INTRODUCTION

Ablative techniques for treating vascular & pigmented lesions such as dermabrasion, laser resurfacing or chemical peels are known to be associated with long, uncomfortable convalescence and a high incidence of adverse side effects and complications.

Non-ablative procedures, using lasers or pulsed light devices, have therefore become popular with busier patients seeking no-downtime procedures.

Each patient has unique demands and expectations when considering treatment for these conditions. The initial goal of the physician should be to understand these needs and to orient patients to the treatment modality that will provide them with the most satisfactory results.

The theoretical basis for the use of lasers and pulsed light systems lies in the theory of Selective Photothermolysis. Based on this

theory, optimal wavelengths and optimal pulse durations are chosen to maximize the effect on treated lesions while minimizing undesirable side effects to surrounding tissues.

Light emitted by the 535 nm handpiece is efficiently absorbed both by hemoglobin in the blood vessels and by melanin in the pigmented lesions. As a result both vascular and pigmented lesions are selectively coagulated and disappear within a few weeks.

Patients referred to pulsed light Beamax treatment were those with predominantly mottled pigmentation, solar lentigo, telangiectasia, facial erythema, rosacea, broken capillaries, post-partum melasma, poikiloderma and port wine stains (PWS).

Anatomical sites treated included the face, neck, chest, lower leg, upper back and hands.

## **MATERIALS AND METHODS**

The system used in this study was the Beamax intense pulsed light system with:

- Long pass filter of 535 nm (VL/PL hand piece)
- Spot size of 6.4 cm<sup>2</sup>
- Fluence range from: 5 to 20 J/cm<sup>2</sup>
- Pulse durations: 10, 12 and 15 msec.

Treatments were conducted at two sites of the American Laser Clinics from

October 2005 to July 2006. Fifty eight (58) subjects aged 24 to 66 (average age 30.1), 42 females and 16 males, with skin types I-V were subjected to an average of 2 to 6 treatments sessions, depending on the lesion type, spaced 4 weeks apart.

Subjects returned 48 hours after each treatment to assess immediate effects and any potential complications. Three months after the last treatment subjects returned for a follow-up visit to evaluate final results and patient satisfaction with the procedure.

Subjective skin lesions clearance percentage was assessed by the physician by comparing pre- and post-treatment photographs while patients evaluated their results by assigning a grade of 1 to 5: 1 indicating no result and 5 indicating a very good result.

Prior to treatment, patients filled out a medical history form and were questioned to rule out any contraindication to pulsed light treatment. Contraindications include tanning of the area within the past 3-4 weeks, use of Accutane within the past 6 months, history of hypertrophic scarring or keloid formation and any skin condition or medications with sensitivity to light. A history of herpes requires use of prophylaxis prior to treatment.

A test spot was first performed on the targeted area to determine optimal fluence

and pulse duration parameters that would usually result in immediate darkening of the lesion with slight erythema and edema surrounding the lesion.

For darker skin types (IV-V) a waiting period of 24-48 hours is recommended to avoid an unexpected delayed response. Once optimal treatment parameters were determined, two passes were performed over the treatment area, apart from the neck and chest areas where treatment was limited to a single pass per session. Full face patients were offered topical anesthesia based on their response to the test spots. Cooling of the skin during treatment was maintained with cold, transparent ultrasound gel or with a flow of cold air (Zimmer, Germany). In patients with predominantly vascular lesions it may be preferable not to cool the area in order to avoid vasoconstriction of the targeted blood vessels. For the same reason the light guide should be floated gently over the skin, without any pressure. Following the procedure it is recommended to cool the area well for 10-15 minutes in order to avoid adverse effects.

With darker skin patients the second pass was sometimes performed with the 580nm skin rejuvenation hand piece since longer wavelengths are less aggressive to dark skin.

Pigmented lesions should darken almost immediately in most of the cases and will exfoliate within a few days. Vascular lesions will shrink immediately and look lighter afterwards.

The parameters most commonly used for the test and treatment procedures and for the different Fitzpatrick skin types are listed in tables (1) and (2). It is generally recommended to perform the first session with somewhat lower settings and to gradually increase the settings from session

to session, based on individual patient response.

**Table 1. Test Protocol**

Fitzpatrick Skin Type	Hand Piece (nm)	Pulse Duration (msec)	Fluence (J/cm <sup>2</sup> )	No. of Pulses
I-III	VL/PL 535-950 nm	10-12 msec	10-12 J/cm <sup>2</sup>	2
IV-V	VL/PL 535-950 nm	15 msec	6-8 J/cm <sup>2</sup>	ONE PASS

**Table 1. Treatment Protocol**

Fitzpatrick Skin Type	Hand Piece (nm)	Pulse Duration (msec)	Fluence (J/cm <sup>2</sup> )	No. of Pulses
I-III	VL/PL 535-950 nm	10-12 msec	up to 15 J/cm <sup>2</sup>	2
IV-V	VL/PL 535-950 nm	15 msec	up to 13 J/cm <sup>2</sup>	ONE PASS

\*On the neck and chest only one pass is indicated.

Pulse durations should generally be set as short as possible, pending determination of patient's skin response. Short pulses are more effective but also more aggressive to the skin so with darker skin types there is usually a need to use longer pulses in order to avoid adverse effects.

**Figure 1. Telangiectasia**



**Figure 2. Broken Capillaries**



**Figure3. Melasma on a 24 female patient**



## RESULTS

### Vascular lesions

On the majority of patients (72%) a subjective skin lesions clearance rate of between 50% to >75% was assigned by the treating physician.

Two patients with telangiectasia and PWS experienced purpura that resolved without any intervention 2 months after the last procedure.

### Pigmented lesions

On the majority of patients (76%) a subjective clearance rate between 50% to >75% was assigned by the treating physician.

These results were in line with expectations based on published results on the use of pulsed light for the treatment of vascular and pigmented lesions. In some patients results were above expectation possibly due to a new Pulse Form technology incorporated in the Beamax system.

Adverse effects, mostly crusting, were minimal (2.4% of the patients) and resolved spontaneously within a few days. No hypo- or hyper-pigmentation complications occurred. Two patients experienced purpura which resolved without any intervention.

## CONCLUSIONS

Our clinical results with the Beamax system are in line with previous publications describing the use of intense pulsed light in the treatment of superficial vascular & pigmented lesions. The first such publication by Bitter PH (2000), reported results on all aspects of photodamage including irregular pigmentation and telangiectasia. The author achieved visible improvement in more than

90% of subjects with minimal downtime and no scarring. 88% of subjects were satisfied with the overall results of their treatments.

As first published by Schroeter and Neumann in 1998 and confirmed by Angermeier in 1999 and Bjerring in 2001, intense pulsed light is a useful treatment for facial telangiectasia. These researchers reported excellent grade of clearance, which was above 90%, minimal side effects and no downtime.

Weiss RA et al (2002) reported long term follow up results on 80 patients treated by intense pulsed light (IPL) during the period 1996 to 1997. At 4 years following initial treatment, telangiectasia was improved in 82% of subjects, while pigmentation remained improved in 79%.

The high measure of patient satisfaction, as found in our own study, was also noted by Fodor L. et al (2004) who reported good to very good results in 93.1% of their patients.

In our experience the new Beamax system demonstrates similar clinical efficacy and safety in reducing pigmented sun damage and vascular irregularities.

A great deal of experience is required when using pulsed light technology. Proper patient selection and critical diagnostics serve to keep the adverse effects of the treatment to a minimum. Both patients and physicians should define realistic expectations for this treatment modality. While highly effective for epidermal dyschromia and superficial vascular lesions (capillary), patients seeking remedy for deeper lesions should consider more aggressive procedures such as lasers, plastic surgery or sclerotherapy.

Alternatively, a combination of pulsed light and dermabrasion for pigmented lesions may allow satisfactory results for these patients while still maintaining the advantage of a no-downtime, low-risk procedure. For superficial vascular lesions patients may

benefit from a combination of pulsed light therapy and sclerotherapy.

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