Treatment of Asian Skin with an Advanced Intense Pulsed Light Source

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Summary

Intense Pulsed Light (IPL) sources have been improved to the point that they rival millisecond pulsed lasers in the visible and near-infrared spectrum, for treatment of many vascular and pigmentary disorders. Compared with second generation IPLs, earlier IPLs emit broader spectral bands including infrared wavelengths absorbed by water, and offer limited pulse control options. Asian skin is particularly prone to post-inflammatory hyperpigmentation, and there is limited data regarding IPL use in Asians. Over one thousand (~1200) Asian patients were treated with either a first generation IPL (Vasculite™, ESC-Lumenis; ~500 patients; 550 nm or 570 nm filter handpieces; 31-35 J/cm²; 2.4 ms and 5 ms pulses with 30 ms delay) or a second generation IPL (Ellipse-Flex™, DDD; ~700 patients; VL-2 or PR handpieces; 9-12 J/cm² or 7-9 J/cm²; 2.5 ms and 2.5 ms pulses with 10 ms delay). Most of the patients (94%) were treated for facial lesions associated with photoaging including lentigo, telangiectasia, and fine wrinkles. Other patients (6%) were treated for congenital nevi, scars, or portwine stains. Efficacy was comparable with both IPLs, but was obtained with much lower fluence (1/3), fewer treatments (1/2) and fewer side effects (1/7) using the second generation IPL. Side effects occurred in 7% of patients after the first generation IPL and 1% with the second generation IPL, consisting of blistering, inflammation and transient pigmentary changes. There was no scarring. In summary, there are strong advantages of second-generation IPL.

Purpose

The purpose for the study was to compare the efficacy and side effects of the first and the second generation IPL systems.

Equipments and Parameters

The first IPL system: Vasculite™, ESC-Lumenis; 550 nm or 570 nm filter handpieces; 31-35 J/cm²; 2.4 ms and 5 ms pulses with 30 ms delay

The second IPL system: Ellipse-Flex™, DDD; VL-2 or PR handpieces; 9-12 J/cm² or 7-9 J/cm²; 2.5 ms and 2.5 ms pulses with 10 ms delay.

The main difference between the first and the second IPL system is that the second generation IPL system has dual mode filtering. The single mode filtering cuts off only shorter wavelengths including ultraviolet, where as the dual mode filtering also eliminates longer wavelengths which are absorbed mainly by water, which unnecessarily heats the skin. Dual mode filtering enables most of the energy applied to the skin to work effectively for hemoglobin or melanin treatment.

Methods

For rejuvenation, entire face sparing the upper eyelids which were covered with metal eye shields, were treated with the parameters shown above.

Patients with pigmentation problems were treated mainly by 550 nm filter handpiece with the Vasculite™ and VL-2 handpiece with the Ellipse-Flex™.

Patients with vascular problems were mainly treated with 570 nm filter handpiece with the Vasculite™ and PR handpiece with the Ellipse-Flex™.

Treatments were repeated every 3 weeks until the patients were satisfied or no further improvements were seen.

Patients were allowed to make ups next day of the treatments.

Results

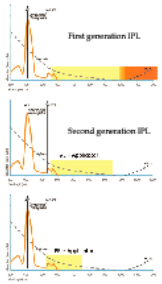
Similar endpoint was obtained with 31-35 J/cm² with the Vasculite™ and 7-12 J/cm² with the Ellipse-Flex™ and with less pain.

Five hundred cases including 469 rejuvenation cases were treated with the Vasculite™ from April 2000 to June 2002. Six hundred and 99 cases including 648 rejuvenation cases were treated with the Ellipse-Flex™ from July 2002 to March 2005. The average numbers of treatment for rejuvenation were 7.5 for the Vasculite™ and 3.2 for The the Ellipse-Flex™. Side effects were seen in 7% of the cases treated with the Vasculite™. Side effects with the Ellipse Flex™ were seen only when we tried aggressively using the PR or PL applicator for restricted areas. Ellipse Flex for rejuvenation using typical parameter never have caused any side effects.

Conclusion

A second generation IPL system, Ellipse Flex™, using the dual mode filtering, requires fewer treatments with lower fluence for rejuvenation on the face, compared with the first generation IPL. The second generation IPL rarely causes side effects, or downtime.

Difference between Single and Dual Mode Filtering

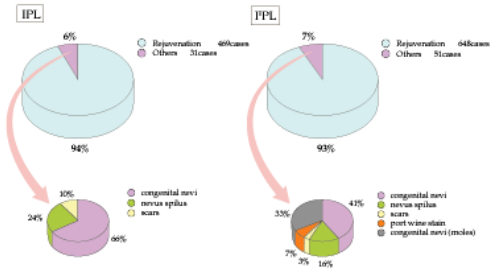


1) The diagram shows the wavelength emitted from the first generation IPL system. The shorter wavelengths including ultraviolet are cut off by the filter. The longer wavelengths are mainly absorbed by water.

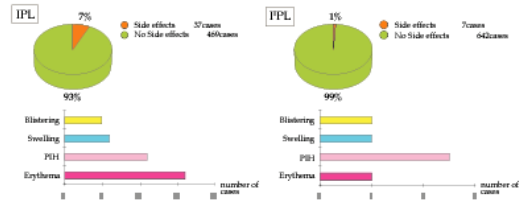
2)The second generation IPL system has a dual mode filtering, which eliminates both shorter and longer wavelengths. The wavelength delivered through the VL applicator is from 555 to 950 nm. This is the applicator we use for most of the cases for rejuvenation.

3)The wavelength through the PR applicator, which is 550 to 750 nm, covers the two peaks for hemoglobin absorption. We prefer using this PR applicator to treat vascular lesions.

Conditions treated with each IPL



Side effects

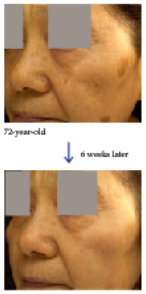


Side effects

Burns sometimes occurred from the first generation IPL maybe associated with the longer wavelengths absorbed by water in the dermis, which generates heat.

Rejuvenation cases with the second generation IPL system

Flat pigmented lesion

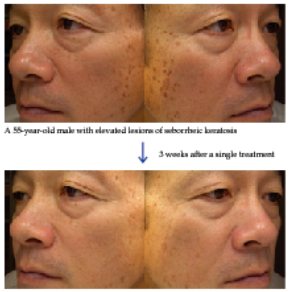


72-year-old

↓ 6 weeks later

2 treatments with the VL-applicator using 9.0J/cm²

Elevated pigmented lesion



A 55-year-old male with elevated lesions of seborrheic keratosis

↓ 3 weeks after a single treatment

9.0J/cm² double shots for the pigmented spots were used.

Melasma and solar lentigines

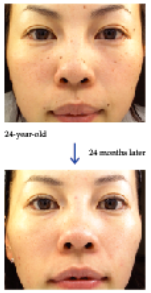
A 43-year-old case with melasma and solar lentigines

↓ 3 months later

After 2 treatments with 9-9.5J/cm² using VL-applicator

Melasma should be basically controlled by conservative methods, mainly of oral administration of tranexamic acid.
Photorejuvenation with Ellipse Flex could accelerate conservative treatment of melasma, such as in this case, 2 IPL rejuvenation has shortened the treatment period, which also removed her solar lentigines.

Moles

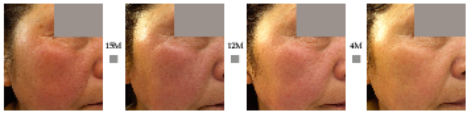


24-year-old

↓ 24 months later

After 15 pick up treatments of the moles with the PL-applicator

Facial erythema and wrinkles



A 63-year-old female with erythema and wrinkles

5 months after 10 first generation IPL treatments.

Seven rejuvenation treatments were performed during the 1 year.
Genesis™(pulsed Nd: YAG) 2 times
IPL with VL-applicator 2 times
Medelife IV™ rejuvenation 3 times

4 months after a single FPL (PR-applicator) treatment, which removed the erythema and wrinkles the most of any other rejuvenatoin treatments she had received.