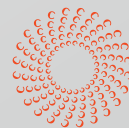


*Compilation of*

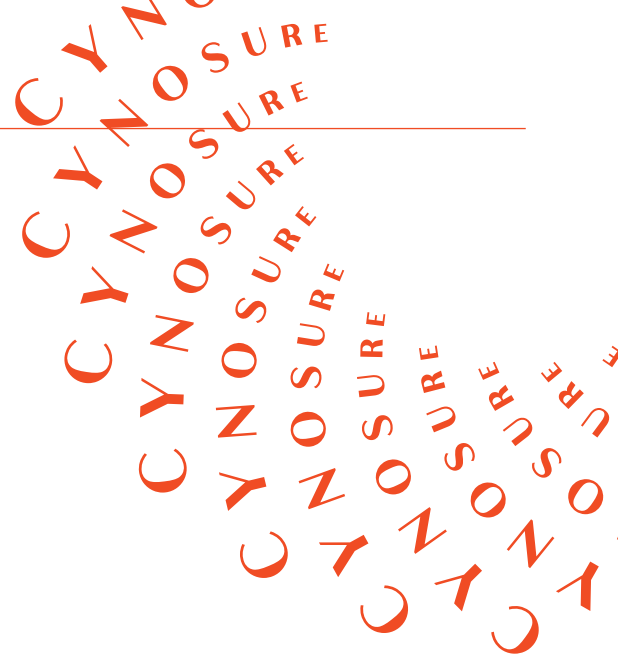
*Dr. Kentaro Oku's  
clinical studies  
and published  
articles on*



*755nm Picosecond and  
RF Microneedling Technology*



**CYNOSURE®**  
BEAUTIFUL ENERGY



## Dr. Kentaro Oku

Dr. Kentaro Oku graduated from Fukushima Medical University in 2008 and obtained his dermatology status in 2010. He is the founder of HILLS GRACE CLINIC and HILLS GRACE: Research and Training Institute of Aesthetic Medicine in the city of Yokohama, Japan.

Dr. Oku has affiliation with the Japanese Dermatologist Association, The Society of Aesthetic Dermatology and ASLMS. Dr Oku actively leads and participates in clinical research projects and has several studies published in dermatology and plastic surgery journals.

Dr. Oku has been involved in the Cynosure APAC Medical Advisory Board since 2019 and has an active role in training and developing Aesthetic Practitioners for the entire APAC region.

In 2024 Dr Oku opened the HILLS GRACE CLINIC; Research and Training Institute of Aesthetic Medicine.



日本美容皮膚科学会  
Japanese Society of Aesthetic Dermatology

Aesthet.Dermatol.  
ISSN 1341-5530

# Aesthetic Dermatology

Aesthetic Dermatology Vol.33, 2023

## Treatment of benign pigmented lesions using a picosecond alexandrite laser

Kentaro Oku, M.D.\*

\*HILLS GRACE CLINIC, Yokohama, Japan 225-0011

**Abstract:** In aesthetic dermatology, the ideal approach to treating benign facial pigmented lesions involves efficiently and safely removing all the lesions at once without side effects. The picosecond alexandrite laser, introduced in 2012, is the first of its kind for clinical use. The laser has a 755 nm wavelength, making it well-suited for skin type III and IV. Basic and clinical research data, both domestically and internationally, confirm its reliability. Of all picosecond lasers currently available, this device has the most comprehensive basic and clinical data. Our retrospective observational studies demonstrated its efficacy and safety for the treatment of benign pigmented lesions. However, since benign pigmented lesions often result from accumulated photodamage and can recur over time and in different areas, long-term follow-up is advised.

**Key Words:** picosecond alexandrite laser, picosecond laser, 755 nm, epidermal pigment removal, dermal pigment removal

Vol.33  
No.4  
December  
2023

日本美容皮膚科学会雑誌

# 形成外科

## ABSTRACT

### Strategies for Skin-Quality Improvement with Minimally Invasive Treatment

Kentaro Oku, MD\*, Mikako Oku, MD\*

The aim of skin-quality improvement treatment is to achieve smooth, elastic, and well-hydrated skin. This requires a multifaceted approach tailored to the individual's skin condition, including replenishing moisture, removing excess melanin, and enhancing collagen production. Regarding injection treatments, Juvederm Vista® Volite™ XC is an injectable filler that uniquely addresses skin-quality improvement by targeting both the structure and the function of the skin. For energy-based device therapies, it is essential to disrupt degenerated structures and reactivate cells and tissues. Different layers of the skin require specific targeting substances. Our facility uses the Picosecond Alexandrite laser (Picosure®Pro) for epidermal approaches, a micro-needle radiofrequency (RF) system (Potenza®) for dermal and basement membrane approaches, and synchronous ultrasound parallel beam technology (Sofwave®I for dermal approaches. These versatile devices allow for both single-device treatments and combination treatments that provide synergistic effects. In terms of skin tightening, the Sofwave® delivers thermal energy in a continuous and directional manner while minimizing pain levels. Our facility developed the Thermal Thread Technique™, which forms thermal threads within the dermis with the use of the synchronous ultrasound parallel beam, resulting in overall skin improvement and tightening effects. In cases with multiple skin symptoms such as pigmented lesions with photodamage, fine lines, enlarged pores, and acne scars, simultaneous approaches to multiple targets in the epidermis and dermis are necessary. Our facility developed CynoGlow™ treatment, which combines the use of the Picosure®Pro laser and the Potenza® RF system in three phases to achieve skin quality improvement. In treatments that are designed to improve skin quality, it is desirable to reconstruct strategies on a case-by-case and treatment-by-treatment basis, as the factors involved may vary depending on the patient's case and skin condition.

\* Hills Grace Clinic, Yokohama 225-0011



# Safety And Efficacy of Picosecond Alexandrite Laser for Treatment of Active Acne Vulgaris in Asians

## Background

Although a variety of energy sources have been used to treat active acne vulgaris, it remains a challenging disease to treat. Recently, picosecond laser for the treatment of tattoo, pigmentations, fine lines and acne scar have shown promising outcomes worldwide. However, there is no report of using picosecond laser for active acne treatment. The objective of this study was to evaluate the safety and efficacy of picosecond alexandrite laser for active acne vulgaris in Asians.

## Study Design/Materials and Method

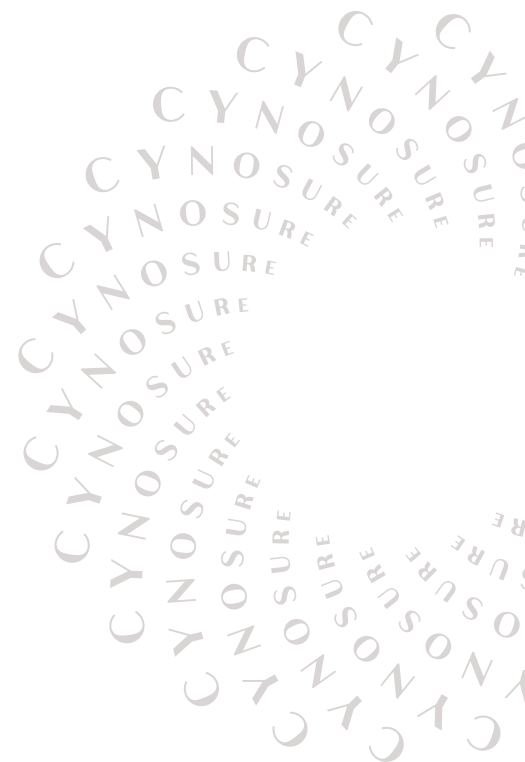
21 patients with active acne who received treatments using picosecond alexandrite laser (Cynosure, Westford, MA) from November 2016 to August 2018 were included in this retrospective study. All subjects were Fitzpatrick skin type III or IV. Each subject received the following procedures at every visit: Initially, puncture extrusion of inflammatory pustule to clear hair follicle. Secondly, laser irradiation with zoom hand piece 4.5mm spot (1.04 J/cm<sup>2</sup>), 550 ps, 3 stack shots on the pustule. Following with whole face laser irradiation with flat optics 5–8mm spot (0.40–1.02 J/cm<sup>2</sup>), 750 ps, 2500–3000 shots. Lastly, whole face laser irradiation with diffractive lens array of 6–8mm spot (0.33–0.57 J/cm<sup>2</sup>), 550 ps, 3500–4000 shots. Patients received above procedures every 4 to 6 weeks depending on acne severity and treatment response. Clinical photographs were taken at baseline, prior to every treatment session with average followup at 5.6 months. Clinical photographs were evaluated independently by two dermatologists. The modified Leeds acne severity scale was utilized to assign a global acne severity.

## Results

The mean acne grade was significantly decreased from 3.64 at baseline to 1.33 at final visit ( $P < 0.001$ ). All the patients had transient erythema immediate after the irradiation that diminished within 24 hours. No severe side effect was observed.

## Conclusion

Treatment of active acne vulgaris using picosecond 755nm alexandrite laser is safe and efficacious in Asians.



# Efficacy and Safety Evaluation of Combining a Novel RF Needle System with a Picosecond Alexandrite Laser for Deep, Active Inflammatory Acne Treatments which Remiss and Reoccur from the same Hair Follicle

## Background

Active inflammatory acne naturally disappears in typical cases but active inflammation can penetrate to a deeper layer of the skin making it harder to treat and often resulting in an acne scar as a side effect for some patients. The eruption has some specific features like structural destruction of hair follicle and Extracellular Matrix(ECM). We evaluated the safety and efficacy of new treatment method through a study which was designed to utilize a combination of RF device and picosecond alexandrite laser to ease present inflammation, prevent reoccurrence of acne from the same hair follicle, and to remodel the hair follicle and surrounding ECM for patients with a long history of acne.

## Materials and Methods

A total of 20 patients who had long history of reoccurred acne with deep inflammation for more than 6 months to receive combination treatment. Fitzpatrick skin types ranged from III to IV. We divided the treatment session into 5 phases as written below.

**Phase 1** - All contents in an inflammatory pustule were extracted by micro forceps.

**Phase 2** - A 4MHz needle RF was irradiated along the wall of hair follicle at the point of 0, 120, 240 degrees.

**Phase 3** - Immediately after, 3 pulses from the picosecond alexandrite laser with a 4.5mm spot, 550ps, were performed to the hyperpigmented area.

**Phase 4** - Picosecond alexandrite laser 6-10mm spot, 750ps, 2 passes were performed over the full face.

**Phase 5** - Picosecond alexandrite laser with diffractive lens, 6-10mm spot, 550ps, 2 passes were performed to whole face.

Digital photographs (including ultraviolet) were taken before and after the treatment to evaluate efficacy. Randomized digital photographs were given to two independent dermatologists who evaluated using the Leeds acne grading system.

## Results

1. Decreasing severity of eruption was statistically significant ( $p < 0.05$ ).
2. Acne reoccurrence rate was decreased by 22% in the first treatment, 7% after second treatment and 2% after third treatment.
3. We didn't see any occurrence of acne scar after the treatment in all cases.
4. Resolution of PIH was evident initially, followed by improvement of existing acne scar.

## Conclusion

The modality of combining new needle RF and picosecond alexandrite laser is safe and effective for the treatment of active acne with deep inflammation which reoccurs and remiss for long periods of time.

# Investigation of the Incidence of PIH and its Factors when Picosecond Alexandrite Laser is used to Remove Benign Pigmented Lesions in Skin Type 3-4

## Background

Although the main aim of laser treatment in Asia is to remove benign pigmented lesions and its efficacy has been widely reported, the high incidence of post-inflammatory hyperpigmentation (PIH) after treatment is a characteristic problem in skin type 3-4. Previous studies have shown that the incidence of PIH with Q-switched lasers is in the range of 30-45%; however, few studies have examined the incidence of PIH in the treatment of benign pigmented lesions with picosecond lasers, and there are no large studies that have examined factors related to PIH incidence.

## Material and Method

The number of PIH occurrences and factors associated with PIH development in 1203 cases who underwent benign pigment removal with picosecond alexandrite laser (PSAL) at a single institution during a 50-month period between July 2016 and August 2020 was retrospectively analyzed. A combined irradiation technique was used at following parameters; a 2.3- to 3.5-mm spot (0 to 0 J/cm<sup>2</sup>) irradiation with zoom hand piece on the local pigment and a 6-10-mm spot (0 to 0 J/cm<sup>2</sup>) irradiation with diffractive lens array on full face.

## Result

The mean age of the cases was 47.0 years, the male to female ratio was 1143:60. The primary diseases were solar lentigen (1073/1203), seborrheic keratosis (501/1203), dermal melanocytosis (Hori's nevus) (55/1203), Nevus of Ohta (12/1203), Freckles (108/1203) and melasma (427/1203). All patients had multiple concomitant pigmented lesions.

The number of PIH occurrences after 4 weeks of treatment was 31 cases (2.57%).

Statistically significant differences between the PIH group and the non-PIH group were found in mean age, the complication of melasma, and the intensity of IWP (immediate whitening phenomenon). The mean age was 4.17 years higher in the PIH group than in the non-PIH group, and the complication of melasma was 13.23% higher in the PIH group. Strong IWP was also observed in the PIH group.

## Conclusion

PSAL significantly reduces the incidence of PIH compared to Q-switched laser in the removal of benign pigmented lesions in skin type 3-4, when properly diagnosed for complication of melasma and irradiated with the appropriate fluence.

# 1: Evaluation of Safety and Efficacy of Combination with Hyperthermic Laser Lipolysis and Electromagnetic Muscle Stimulation for Body Contouring

## Background

Non-invasive body contouring is one of the most interested themes in the aesthetic medicine. Although there are some studies indicating each modality alone treatment proved effective, there is no report of combination of Hyperthermic Laser Lipolysis(HLL) and ElectroMagnetic Muscle Stimulation(EMMS) to achieve better result. The objective of this study was to evaluate the safety and efficacy of combination method using HLL and EMMS.

## Materials and Methods

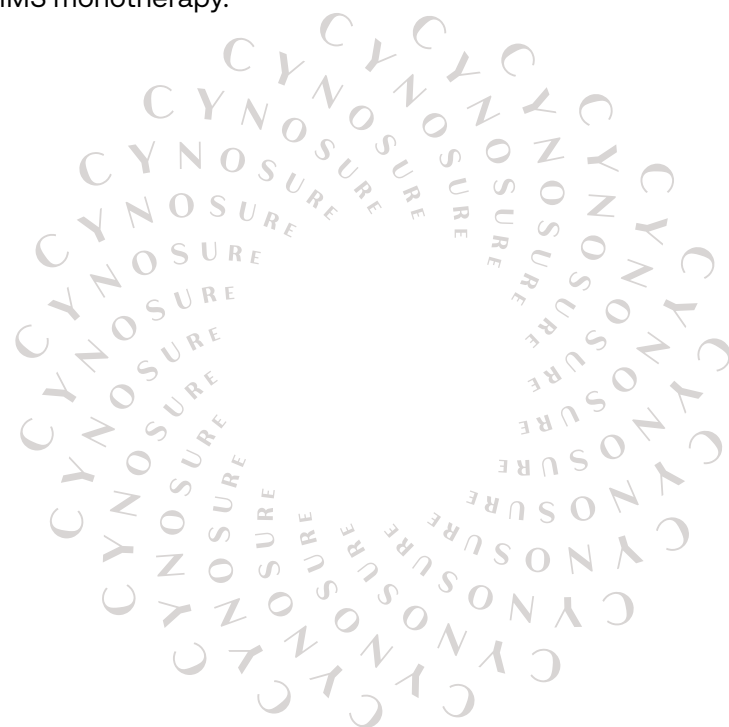
A set of 35 patients (3 males and 32 females, BMI  $22.48 \pm 3.49$  kg m<sup>-2</sup>, Age  $41.6 \pm 9.30$ ) were enrolled (20 for abdomen, 15 for thigh). Their muscle type was identified according to the response to high and low frequency with electromagnetic field on the beginning of treatment session (Type I: 24, Type II:11). Patients received the treatment consists of 8 times EMMS (once a week) according to muscle type and 4 times HLL (once every two weeks) on the same site. Digital and 3D photographs are taken at baseline and end of treatment period and circumference on target site was measured by 3D structural image to avoid measurement error between examiners. These photographs were evaluated by independent plastic surgeons, and measurement data was analyzed with parametric paired t-test. A patient satisfaction questionnaire was completed by each patient at end of treatment period.

## Results

35 patients completed the treatment. 3D structural image shows circumference reduction on all the measured parts with statistical significance ( $p < 0.01$ ). Independent evaluators correctly identified 94% of the pre and post treatment images. All patients experienced muscle fatigue and heat sensation on treatment site immediately after the procedure, but there was no adverse event during and after the treatment period. 86% of patients reported the satisfaction as very satisfied or satisfied on a 5-point Likert scale.

## Conclusion

Based on the condition assessment in the digital and 3D photographs and patient's satisfaction it can be concluded that the combination of HLL and EMMS is safe and effective for body contouring, and it tends to be easier to sculpt target area compared with HLL or EMMS monotherapy.





## 2: Double Layer Approach with Picosecond Alexandrite Laser and Micro Needle RF Device for Total Skin Rejuvenation

### Background

Skin is bi-layer structure that each layer has different functions and features. Since the cause of skin trouble such as pigmentations, wrinkles and pore dilatation would be seen in both layers in every patient, it is important to improve both layers at the same time for total skin rejuvenation. The objective of study is to evaluate the efficacy and safety of complementary bi-layered treatment method using picosecond alexandrite laser for epidermis and micro needle RF system for dermis.

### Materials and Methods

A set of 15 patients (15 females, age  $37.5 \pm 13.3$ ) are recruited. They received 3 sessions of treatment consisted with micro needle pulsed-RF irradiation using infusion tips applied with tranexamic acid solution on full face followed by picosecond alexandrite laser irradiation on pigment regions with 550ps, 1.31-1.57J/cm<sup>2</sup>, 1-3 stack shots on each region and 0.33 J/cm<sup>2</sup>, 550ps 1 pass for full face. The treatment interval was 6weeks. Digital photograph and UV image with skin analyzer were taken at base line, each treatment visit and 4weeks post of final treatment to evaluate the efficacy by independent evaluator using global aesthetic improvement scale (GAIS). Dermatology life quality index (DLQI) evaluation was conducted at first visit and last visit.

### Results

The effects they could recognized were pigment removal of aging related facial pigmentations and post inflammatory hyperpigmentation due to acne, texture improvement, wrinkle reduction on peri orbital area, improvement of skin laxity on cheek, pore size reduction on cheek, and brightening effect on full face.

Efficacy evaluation with GAIS were as follows; 3 (20%) Excess improvement, 7 (47%) Very improved, 5 (33%) Improved, 0 (0%) Unaltered, 0 (0%) Worsened. DLQI score improvement is statistically significant ( $p < 0.05$ ). Evaluator correctly identified pre and post treatment images for 93%. No severe side effect was reported.

### Conclusion

The study showed that the complementary treatment method has multiple effects with high efficacy and patient satisfaction without causing severe side effects.

### 3: The Efficacy and Safety of Complementary Pigment Removal with Picosecond Alexandrite Laser and Topical 5% Cysteamine Cream for Asian Skin.

#### Background

The main target of laser treatment in Japan is removal of aging related facial pigmentations. The most frequent adverse event is post inflammatory hyper-pigmentations (PIH) due to laser irradiation. Although the incidence and risk factors of PIH were identified with our report, it is necessary to develop safe and efficacious pigment removal method. The aim of this study is to evaluate the safety and efficacy of combination treatment with picosecond alexandrite laser and topical 5% cysteamine cream for aging related facial pigmentations.

#### Materials and Methods

A set of 35 patients (35 females, Age  $46.0 \pm 10.7$ ) with no history of skin sensitivity were enrolled. Each patient received picosecond alexandrite laser irradiation on full face followed by topical cysteamine cream once daily with moisturizer. Laser treatment interval is 6-8 weeks according to patient skin response while continuing topical cysteamine. The laser treatment is up to 3 times according to skin reaction with followed parameters;  $\phi 2.2-3.1\text{mm}$  ( $2.19-3.97 \text{ J/cm}^2$ ) flat optic, single shot on local pigment with 550ps.  $\phi 6-8\text{mm}$  ( $0.4-0.67 \text{ J/cm}^2$ ) fractional optic, 2 passes on full face with 550ps.

Digital photograph and UV image were taken at base line, each treatment visit and 4weeks post of final treatment to evaluate the efficacy by independent evaluator using global aesthetic improvement scale (GAIS). A patient satisfaction questionnaire was completed by each patient at last visit.

#### Results

All subjects had mixture of several pigment disorders including solar lentigo, seborrheic keratosis, freckles, Hori's nevus and melasma.

Average treatment number was  $1.9 \pm 0.6$ . GAIS rating at 4 weeks from final treatment was as follows; 5 exceptional improvement, 16 very improved, 11 improved, 3 unaltered and 0 worsened. Independent evaluator correctly identified 91% of the pre and post treatment images. 77% of patients reported the satisfaction as very satisfied or satisfied on a 5-point Likert scale.

Side effects due to topical cysteamine had seen in 6 cases: 3 erythema, 2 irritation, 1 dryness, all subsided with moisturizer.

There was no incidence of PIH during and after the treatment period.

#### Conclusion

Based on the results it can be concluded that the complementary pigment removal with PSAL and topical 5% cysteamine cream is safe and efficacious for aging related facial pigmentations without causing PIH for Asian skin.

## 4: Evaluation of Radiofrequency for Correcting Clinical Signs of Laxity in Facial Retaining Ligaments

### Background

There are several important changes in the face that contribute to the traditional signs of aging that drive patients to seek external procedures to correct. These include thinning of the epidermal and dermal tissue and attenuation of the superficial muscular aponeurotic system (SMAS) layer, volumetric deflation and displacement of the fat compartments, reduction in bony support and elongation of the retaining ligaments. A variety of non-surgical treatments have been adopted to attempt to correct some of these signs of facial aging, including using energy-based devices to stimulate new collagen and elastin networks, radiofrequency to create tightening of the tissue and fillers to correct obvious volume loss. This study aimed to optimize the treatment methodology with a non-invasive radiofrequency treatment to maximize effect on the retaining ligaments in support of its other noted actions of improving skin laxity and reducing lines and wrinkles.

### Materials and Methods

20 subjects (all female) were enrolled at two sites, with an average age of 53.4 ( $\pm 10.9$ ) years. The subjects were treated on the face and neck with up to 4 sessions of radiofrequency using a 15mm probe (average number of treatments for the group was 2.0 ( $\pm 1.15$ )). Treatment method included coverage of the whole face but with focus on delivery of the radiofrequency energy to the 4 retaining ligaments that form the main architectural suspension structures of the face: the orbital retaining ligament, the zygomatic retaining ligament, the buccal maxillary retaining ligament and the mandibular retaining ligament. Photographs were taken using an advanced photographic system for blinded assessment by independent physician.

### Results

At the time of submission, 11 of the subjects had completed treatments with follow-up photographs for blinded assessment and 16 of the subjects were assessed by the treating physician. Assessment by the treating physician using a 5-point scale Clinical Global Aesthetic Improvement Scale found that 94% of subjects were improved when comparing baseline and follow-up imaging. Notable improvements included visible reduction of marionette and nasolabial lines, lifting of the mid cheek region and orbital regions and benefits to skin texture. Blinded evaluators were able to correctly identify the post treatment imaging when randomized with baseline imaging 81% of the time. Subjects did not report any adverse events associated with the treatment.

### Conclusion

In addition to existing noted clinical benefits of non-invasive radio-frequency such as improvement in skin laxity, texture, appearance of lines and wrinkles, this technology offers a safe and effective option for addressing the early clinical signs of laxity by targeting the facial retaining ligaments during treatment and producing vertical tightening consequence to the clinical appearance of the subject.

# Simultaneous Treatment for Active Acne and Acne Scar with Complementary Strategy using Fractionated Pulsed RF and Picosecond Alexandrite Laser

## Background

Acne is a major skin trouble that bother the patients in both physical and psychiatric aspects. Since it often leaves scar including post inflammatory pigmentation in epidermis and dermal degeneration, it is critical to treat active acne and acne scar at the same time with both layered approach to get early recovery and to prevent further damage to skin tissue. This study is aimed to evaluate the safety and efficacy of complementary treatment using fractionated pulsed RF and picosecond alexandrite laser for total acne treatment.

## Materials and Methods

A set of 32 patients (30 females, 2 males, age  $35.5 \pm 12.1$ ) who have active acne and acne scar were enrolled. All subjects were Fitzpatrick skin type III or IV. They received 3 sessions of treatment consisted with fractionated pulsed-RF irradiation with infusion tips immediately after applying the tranexamic acid solution on dermal damaged area followed by picosecond alexandrite laser irradiation on PIH and inflammatory regions with 550ps, 1.31-1.70 J/cm<sup>2</sup>, 1-2 stack shots on each region and 0.21-0.33 J/cm<sup>2</sup>, 550ps, 1 pass for full face. The treatment interval was 6 weeks. Digital photograph and UV image with skin analyzer were taken at base line, each treatment visit and 6 weeks post of final treatment to evaluate the efficacy by independent evaluator using global aesthetic improvement scale (GAIS). A patient satisfaction questionnaire was completed by each patient at last visit.

## Results

There was a tendency that the improvement of inflammatory region after the first treatment session and the improvement of PIH, pore size and skin texture were seen after second and third session. GAIS rating at 6 weeks from final treatment was as follows; 7 (22%) Excess improvement, 17 (54%) Very improved, 7 (22%) Improved, 0 (0%) Unaltered, 0 (0%) Worsened. 78% of patients reported the satisfaction as very satisfied or satisfied on a 5-point Likert scale. Downtime after each treatment were erythema, edematous erythema, and skin roughness, all of which resolved within 48 hours. No severe adverse reactions such as scarring or vitiligo were observed.

## Conclusion

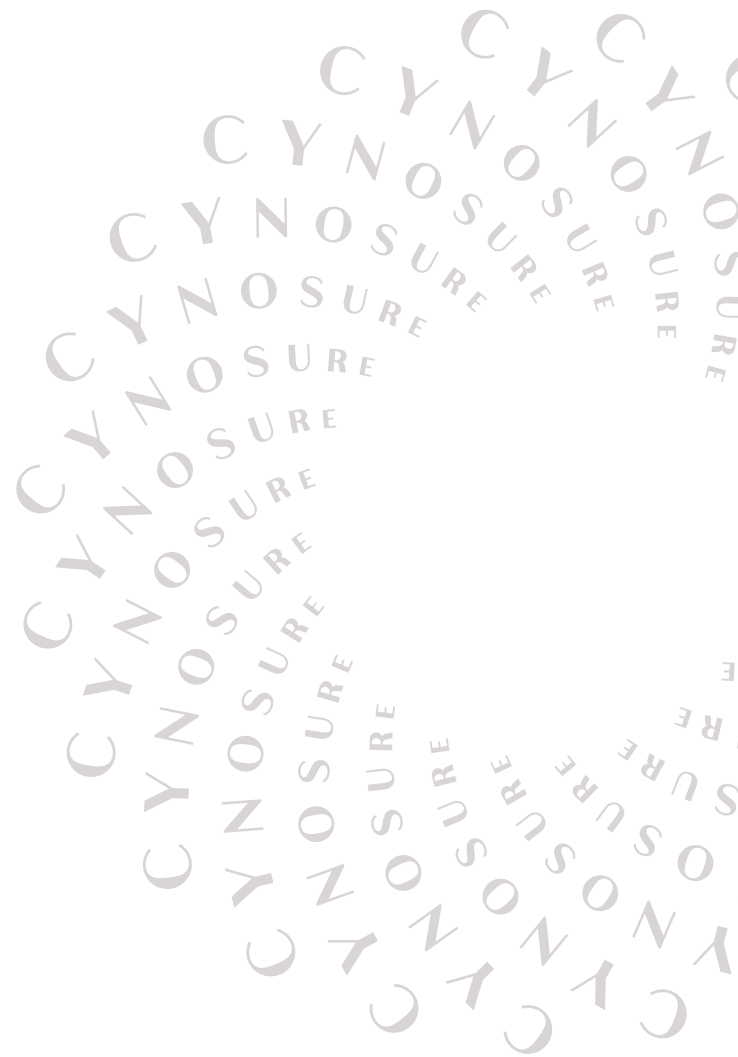
The complementary treatment with fractionated pulsed RF and picosecond alexandrite laser is safe and effective to treat active acne and acne scar at the same time.

# Non-Invasive Approaches to FACIAL CONTOURING in Asians

(As a invited speaker for educational session)

## Abstract:

Non-invasive facial contouring for Asian patients demands an approach that extends beyond traditional volume reduction, addressing unique aesthetic needs. This study explores the efficacy of combined methods, such as sequential monopolar and bipolar pulsed radiofrequency (SMBPRF) and high-intensity focused ultrasound (HIFU) with a novel thermal thread technique, tailored for significant negative vertical changes and enhanced skin tightening. Additionally, the role of color correction using a fractionated 755 nm picosecond alexandrite laser is assessed. The clinical evaluation includes 15 subjects, showcasing the effectiveness of these technologies in refining facial aesthetics by integrating structural and tonal modifications. Results underline the critical influence of skin tone on contour perception and the necessity of a multifaceted treatment protocol to meet the aesthetic expectations of Asian patients. This integrated approach suggests a promising direction for future developments in non-invasive facial contouring techniques.





## WCD 2023 in Singapore

# Long-term safety and efficacy analysis of picosecond alexandrite laser for benign pigmentary disorders

### Background:

Laser treatment has been increasingly used to treat benign pigmentary disorders in Asia following the introduction of picosecond lasers. Although many studies reported the short-term outcomes of laser treatment, few evaluated their long-term safety and efficacy in large patient populations. The aim of this study is to investigate the long-term safety and efficacy of picosecond alexandrite laser (PSAL) treatment for benign pigmentary disorders.

### Materials and method:

This retrospective study included 786 patients who underwent benign pigment removal with PSAL used more than twice between July 2016 and December 2022 in a single facility. In all cases, the treatment endpoint of irradiation was the appearance of the immediate slight whitening phenomena (IWP) over each pigmentary lesion. Logistic regression analysis was performed with the incidence of PIH as the dependent variable and patient age, Fitzpatrick skin type, sex, number of treatments, Global Aesthetic Improvement Scale (GAIS) and disease type as the independent variables.

### Results:

The mean age was  $45.8 \pm 11.7$  years, and the male/female ratio was 762:24. The primary diseases were solar lentigines, seborrheic keratosis, Hori's nevus, nevus of Ota, and freckles in 703, 408, 42, 9, and 71 respectively. Almost patients had multiple concomitant pigmented lesions. GAIS ratings at 6 weeks after final treatment were "very much improved," "very improved," "improved," "unaltered," and "worsened" in 137 (17.4%), 265 (33.7%), 357 (45.4%), 27 (3.4%), and 0 (0%) patient, respectively. Adverse reactions were post-irradiation erythema/edematous erythema, transient vitiligo, and postinflammatory hyperpigmentation (PIH). Of these, only PIH persisted for more than 2 weeks, occurring in 44/786 (5.6%) patients. There were no significant differences in sex, age, disease type, skin type, number of treatments, and GAIS between the PIH and non-PIH groups.

### Conclusion

PSAL was a highly effective and safe treatment with minimal adverse reactions for benign pigmentary disorders regardless of patient age, sex, skin type, and disease type.

# Simultaneous Treatment for Active Acne and Acne Scar with Complementary Strategy using Fractionated Pulsed RF and Picosecond Alexandrite Laser

## Background:

Acne is a major skin trouble that bother the patients in both physical and psychiatric aspects. Since it often leaves scar including post inflammatory pigmentation and dermal degeneration, it is critical to treat active acne and acne scar at the same time with both layered approach to prevent further damage to skin tissue. This study is aimed to evaluate the safety and efficacy of complementary treatment using fractionated pulsed RF and picosecond alexandrite laser for total acne treatment.

## Materials and Method:

A set of 32 patients (30 females, 2 males, age  $35.5 \pm 12.1$ ) who have active acne and acne scar were enrolled. All subjects were Fitzpatrick skin type III or IV. They received 3 sessions of treatment consisted with fractionated pulsed-RF irradiation with infusion tips immediately after applying the tranexamic acid solution on dermal damaged area followed by picosecond alexandrite laser irradiation on PIH and inflammatory regions with 1-2 stack shots on each region and 1 pass for full face. The treatment interval was 6 weeks. Digital photograph and UV image with skin analyzer were taken at base line, each treatment visit and 6 weeks post of final treatment to evaluate the efficacy by independent evaluator using global aesthetic improvement scale (GAIS). A patient satisfaction questionnaire was completed by each patient at last visit.

## Results:

There was a tendency that the improvement of inflammatory region after the first treatment session and the improvement of PIH, pore size and skin texture were seen after second and third session. GAIS rating at 6 weeks from final treatment was as follows; 7 (22%) Excess improvement, 17 (54%) Very improved, 7 (22%) Improved, 0 (0%) Unaltered, 0 (0%) Worsened. 78% of patients reported the satisfaction as very satisfied or satisfied on a 5-point Likert scale. Downtime after each treatment were erythema, edematous erythema, and skin roughness, all of which resolved within 48 hours. No severe adverse reactions such as scarring or vitiligo were observed.

## Conclusion:

The complementary treatment with fractionated pulsed RF and picosecond alexandrite laser is safe and effective to treat active acne and acne scar at the same time.

# Complementary Bi-layered Approach to Skin Rejuvenation: *Picosecond 755nm Alexandrite Laser and Radiofrequency Microneedling*



## **Kentaro Oku, MD**

**HILLS GRACE CLINIC, Yokohama, Japan.**

Dr. Kentaro Oku graduated from Fukushima Medical University in 2008 and obtained his dermatology status in 2010. He is the founder of Hills Grace Clinic in the city of Yokohama, Japan. Dr. Oku has affiliation with the Japanese Dermatologist Association, The Japanese Society of Aesthetic Dermatology and ASLMS. Dr. Oku is highly active in academic research with a number of submissions to the ASLMS and has worked on publishing articles locally and internationally. Dr. Kentaro Oku has served on the Advisory Board of major energy-based device and skin care product companies. Dr. Kentaro Oku has been involved in the Cynosure APAC Medical Advisory Board since 2019 and has an active role in training and developing Aesthetic Practitioners for the entire APAC region.

## **Introduction**

The typical patient that presents for 'skin revitalization' is likely to have a combination of several clinical factors, such as pigmentation from photodamage or pigmentary disorders like melasma, wrinkles and/or acne scars, pore dilation, textural irregularities, and skin laxity. All of these have roots of origin or visible presence in both the epidermal and dermal layers of the tissue, often necessitating therapy programs of 2 or more different treatment technologies to be interwoven and may mean multiple attendances by the patient to the clinic. Factors which contribute to patient satisfaction include clinical outcome to be rapidly visible, minimal downtime from social activities and as little discomfort associated with the treatment as possible. Hence why 70% of consumers consider undergoing non-invasive treatments <sup>(1)</sup>. To be able to make targeted improvement to both of the main skin lamina in a single treatment session could make redundant the need for an interwoven treatment schedule and accelerate treatment outcomes.

However, blending of different treatment modes/ technologies must be carefully demonstrated to not increase risk of side effects through multiple energy deliveries to the epidermis in close proximity.

The Picosecond 755nm Alexandrite laser has demonstrated nearly a decade of safety and efficacy of treatment of pigmentation and the improvement of the appearance of wrinkles and large pores. The usefulness of radiofrequency technology in conjunction with micro-needling for acne scarring, periorbital and perioral rhytides, skin laxity, post-traumatic/burn scars, and striae distensae has been reported <sup>(9)</sup>.

## **Clinical Study**

Following the highly successful introduction of Potenza radiofrequency microneedling device to my clinic, where the PicoSure® Pro laser has already been my number 1 go-to remedy for pigmentation issues, I recently conducted a study to assess the safety and efficacy of performing these two technologies one after the other, within a single treatment session.

My experience with these two leading devices suggested that I could do this to take advantage of the therapeutic outcomes of each separate mode of action in a compressed treatment timescale for the patient without increased risk of the patient experiencing unwanted treatment effects.

In that study, 15 Asian female patients were treated with 3 individual sessions of sequential treatment with the Potenza™ radio-frequency micro-needling device and the PicoSure Pro 755nm laser with 6-week intervals between each treatment appointment. In the first stage of the treatment a single pass of the full face was made with Potenza RF microneedling, using the Fusion™ Tip (CP-21), which is exclusive to the Potenza device and brings a triplex of treatment effects to the skin; 1. Mechanical effect by microneedle insertion, 2. Coagulation by Radio Frequency energy, and 3. Enhanced penetration of applied topicals. This therapy is immediately followed by treatment with the PicoSure Pro laser, using the Zoom handpiece first to address localized pigments and then the 8mm Flat optic for one pass to address the full face. Digital photographs and UV images taken before the first treatment and 4-weeks post the final treatment identified:

- **Reduction of visible age-related pigmentations and post-inflammatory hyper-pigmentation (PIH)**
- **Wrinkle reduction on the peri-orbital areas**
- **Improved firmness of the skin\***
- **Pore reduction on the cheek and a brightening effect on the full face**

An independent external evaluator correctly identified the pre and post treatment images in 93% of cases and graded the treatment outcome as excessively improved, very improved or improved in 100% of cases using a global aesthetic improvement scale (GIAS). Patients undertook a dermatology life quality index (DLQI) evaluation at the first and last visit and the overall group improvement score change was statistically significant at  $7.9 \pm 4.6$  before treatment, and  $5.7 \pm 3.2$  after treatments ( $p < 0.01$ ).

No unexpected side-effects from the cumulative treatments were experienced than those already widely recorded for each of the separate treatment options. These side effects included:

- **Generalized erythema which lasted typically an average of 12 hours (up to 48 hours in some cases)**
- **Edematous erythema lasting up to 72 hours**

In less frequent cases:

- **Intradermal petechiae, especially around the more delicate tissue around the eyelid for 5-7 days**
- **Acne outbreak 2-3 days post treatment, for up to 10 days**
- **Post inflammatory pigmentation, occurring 2-3 weeks post treatment and lasting up to 3 months**

This study demonstrated that visible outcomes and patient satisfaction is high when both the Potenza RF microneedling and PicoSure Pro laser devices are used in the same treatment session without causing undue side effects other than those that might be expected from either device.

### Creating a Refined Treatment Procedure

Following on from this study, I have continued investigation of this complementary minimally-invasive treatment method to refine the protocol for practitioners with these two unique technologies: Energy Blending of the Potenza Fusion tip and 755nm alexandrite picosecond laser PicoSure Pro. This new treatment in partnership with Cynosure is called CynoGlow™.

Introducing the CynoGlow skin treatment –a five-in-one, efficacious treatment personalized for patients' skin to tackle pigmentation, texture, pores and wrinkles. With just 3 short, minimally invasive treatments your patients can remove the unwanted pigmentation, rough texture and enhance the true good in your skin's collagen so you can quickly be back to portraying your best self.

**CynoGlow combines the power of 2 of our best products:**

### *PicoSure Pro/*

is the latest generation of the PicoSure laser system, the first commercial picosecond laser to be released to the medical aesthetic market and the only picosecond device with a 755nm alexandrite wavelength. PicoSure Pro is the only picosecond laser FDA-cleared to treat melasma pigment, nevus of ota and hori's nevus. It resurfaces your skin so that it is noticeably brighter and even toned. The PicoSure technology won the 2021 and 2022 New Beauty award for "Best Multitasking Device for Addressing Multiple Needs."

The 755nm wavelength has a much higher melanin to blood absorption ratio compared to other

common picosecond wavelengths, such as 1064nm, meaning it is much more specific to treatment of melanin without damaging nearby blood vessels and causing the associated unwanted side effects that come with that <sup>(10)</sup>.

## Potenza/

is the only radiofrequency micro-needling device to offer both mono and bi-polar radiofrequency at 1MHz and 2MHz frequencies. The Potenza device, our most advanced radiofrequency microneedling solution which tightens your skin, stimulating the activation of collagen and elastin.

It has a suite of 10 types of treatment tips; Tiger Tip™ Technology (semi-insulated), Insulated and the new Fusion Tip which gives me flexibility to customize treatments for each of my patients. The Fusion Tip, while also delivering thermal energy into the dermis with its associated clinical benefits, also has an exclusive dual chamber design which can enhance penetration of any topical product present on the skin's surface during treatment by up to 67% compared to a standard insulated radio-frequency micro-needling tip <sup>(11)</sup>. This gives me the opportunity to use applied topicals during treatment as I might deem it beneficial for an individual patient's prescriptive needs.

**CynoGlow™ – remove the bad, enhance the good. Uncover perfect, glowing skin.**

## CynoGlow Treatment Procedure

I use the CynoGlow (in partnership with Cynosure)

treatment procedure for patients with any or a mix of the following issues:

- **Visible dilated pores**
- **Acne scars with/without PIH**
- **Photo-damaged skin with sunspots on the face/neck/decolletage**
- **Dyschromia (including melasma)**
- **Tightening of the skin on the face/neck**

Since my patient demographic is an Asian skin type, I am always cautious of the risk of generating post-inflammatory hyper-pigmentation, especially when using many laser or light-based systems. For that reason, I use Potenza with the Fusion Tip as the first stage of my treatment procedure, this gives me the opportunity to deliver the thermal effect of the radio-frequency energy into the dermis as well as boost the penetration of chosen topical agents.

## Treatment Settings

Prior to commencing treatment, I recommend the use of a topical anesthesia as per normal instruction for its use and then clean the skin of any residue of this before commencing the energy treatments. After the Potenza treatment, gently cleanse the skin with gauze and normal saline to remove any remaining topical substances or pinpoint spots of blood that might have been caused by the needle insertion before starting treatment with the PicoSure Pro laser.

TREATMENT STAGE	DEVICE	TREATMENT TIP/HANDPIECE	SETTING RANGE	#PASSES OF TREATMENT AREA
1	Potenza	Fusion Tip (CP-21)	1 MHz Monopolar 5 Pulses per Pulse (20ms ON – 5ms OFF) Depth: 1.25-1.75mm Impact Level: 7 6W (600mJ/Pulse)	1 pass
2(a)	PicoSure Pro	755nm ZOOM: 3.7-4.0mm	550ps (Turbo ON) 2.5Hz 1.57 J/cm <sup>2</sup> – 1.31 J/cm <sup>2</sup>	1-3 pulses on local pigments*
2(b)	PicoSure Pro	755nm FLAT: 8mm	550ps (Turbo ON) 10Hz 0.33 J/cm <sup>2</sup>	1-2 passes

\*Excluding melasma



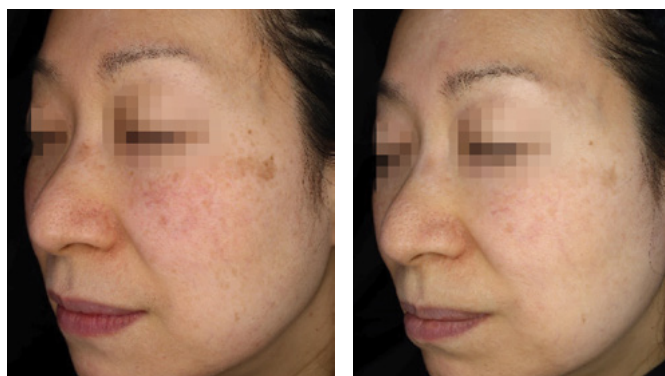
With these treatment parameters, which err on the conservative energy side of the parameters often utilized when these devices are delivered on their own, I can ensure effective results for my patients while limiting unwanted side effects. Those side effects that are experienced are no more severe than the patient might have expected when having monotherapy with one or the other treatment.

## Treatment Results

In this first case we have a 27-year-old who has suffered with chronic PIH with scarring from acne and enlarged pores. Two CynoGlow treatments have provided an outcome that the patient is thrilled with.



This second case is of a 49-year-old patient before and after 2 treatment sessions:



Final case, 56-year-old patient before and after 2 treatments:



PicoSure Pro is the only picosecond device with an FDA cleared indication specifically for pigmentation due to melasma pigment as well as Nevi of Ota and Hori.

The greatest advantage of this treatment is that it can simultaneously improve coexisting skin problems such as dilated pores, acne scars, and fine lines and wrinkles while treating pigmented lesions, the most common target in Asian aesthetic medicine. In addition, the number of treatments can be reduced, and the total treatment period can be shortened compared to the mono therapy using PicoSure Pro Laser and Potenza RF microneedling device, thus maintaining high patient compliance. Patients will notice an improvement in their skin in a shorter period of time after treatment, which will increase their confidence in the practitioner and clinic and encourage them to continue treatment, which is a major advantage for both the patient and the clinic.

## References:

- (1) MEDICAL AESTHETICS MARKET -GLOBAL FORECASTS TO 2025 Downloaded from <https://www.marketsandmarkets.com/Market-Reports/>
- (2) C. Cheshunt, J. Deihl, G. Lask, Treatment of nevus of ota with a picosecond 755-nm alexandrite laser. *Dermatol Surg.* 2015; 41(4): 508-536.
- (3) JC. Chan, SY. Shek, T. Kono, CK. Yeung, HH. Chan. A retrospective analysis on the management of pigmented lesions using a picosecond 755-nm alexandrite laser in Asians. *Lasers Surg Med.* 2016; 48(1): 23-29.
- (4) EM. Tanghetti. The histology of skin treated with a picosecond alexandrite laser and a fractional lens array. *Lasers Surg Med.* 2016; 48(7): 646.
- (5) S. Khetarpal, S. Desai, L. Kruter, H. Prather, K. Petrell, J. Depina, K. Arndt, JS. Dover. Picosecond laser with specialized optic for facial rejuvenation using a compressed treatment interval. *Lasers Surg Med.* 2016; 48(8): 723-726
- (6) Y. Ge, L. Gho, Q. Wu, M. Zhang, R. Zeng, T. Lin. A prospective split-face study of the picosecond alexandrite laser with specialized lens array for facial photoaging in Chinese. *JDD.* 2016; 15(11): 1390-1396.
- (7) YT. Chen, ET. Lin, CC. Chang, BS. Lin, HM. Chiang, YH. Huang, HY. Lin, KY. Wang, TM. Chang. Efficacy and safety evaluation of picosecond alexandrite laser with a diffractive lens array for treatment of melasma in Asian patients by VISIA imaging system. *Photobiomodul Photomed Laser Surg.* 2019; Aug 14 Epub ahead of print
- (8) S. Hu, CS. Yang, SL. Chang, YL. Huang, YF. Lin, MC. Lee. Efficacy and safety of the picosecond 755-nm alexandrite laser for the treatment of dermal pigmentation in Asians - a retrospective study. *Lasers Med Sci.* 2020. *Lasers Surg Med.* 2020; 30(6): 1377-1383.
- (9) TS. Alster, PM. Graham. Microneedling: A review and practical guide. *Dermatol. Surg.* 2018; 44(3):397-404.
- (10) SL. Jacques. Optical properties of biological tissues: a review. *Phys. Med. Biol.* 2013; 58(11): R37-61
- (11) C. Dierickx. The Potenza Fusion Tip: Enhanced penetration of topical products. White paper, Cynosure 2021.

©2022 Cynosure, LLC. All rights reserved. Cynosure, LLC owns exclusive rights to photography. Use of photography without written permission of Cynosure is prohibited.

Cynosure, Tiger Tip, PicoSure and Platinum focus lens are registered trademarks and trademarks of Cynosure, LLC. Potenza is a trademark of Jeisys Medical, Inc.

PicoSure Pro 755 with the Flat Lens is FDA cleared to treat pigmented lesions in skin types I-VI. PicoSure Pro 755 with the Platinum Focus Lens is FDA cleared to treat acne scars and wrinkles in skin types I-IV. Patient results will vary.

The Potenza radiofrequency microneedling device is intended for electrocoagulation and hemostasis of soft tissue for dermatologic conditions. Potential side effects include temporary redness, temporary tingling, and burning sensation while receiving treatment.

Like all medical procedures, not all patients are suitable for the treatment. A qualified practitioner is solely responsible for evaluating each subject's suitability to undergo treatment and for informing those being treated about any risks involved with the treatment, pre-and postoperative care, and any other relevant information. Individual results may vary and are not guaranteed. Model(s) for illustrative purposes only and are not real patients.

# My Go-To Acne Protocols

DR KENTARO OKU is a renowned dermatologist based in Japan and has been involved in the Cynosure APAC Medical Advisory Board since 2019. Here, he shares his expertise in acne treatments.

## Dr Oku, what is your experience with acne patients?

As a dermatologist, I have been regularly seeing acne patients since I started practicing. Especially during the past few years when wearing masks was necessary, I have noticed an increase in acne patients and have developed various treatment options. Acne is a disease where dysfunction and overactivity of the skin occur simultaneously, so in addition to oral and topical treatments, treatments using energy-based technologies tailored to each patient's symptoms are an effective choice. Currently, we have introduced four special treatment methods developed in our clinic, tailored to the symptoms, and the treatment effectiveness has significantly improved compared to a few years ago.

The advancements in oral and topical treatments in dermatological practice in Japan might have led to a slight decrease in the number of patients overall, but there is an increasing trend in the number of visits for severe acne. In particular, there was a noticeable increase in moderate to severe acne patients coinciding with the period when mask-wearing was necessary.

## What are some treatment options you recommend for active acne?

The necessary treatment varies depending on each individual case, but as a general treatment for active acne, we promote epidermal turnover with retinol and suppress sebum production using ingredients like vitamin C, while using EBD (Energy-Based Devices) for the extraction of Acne core as well as simultaneous inflammation sedation and skin remodelling. By implementing a multi-aspected approach as early as possible, we can protect the skin tissue around the acne and prevent acne scars.

## What are treatment options for acne scars?

Although treatment combining subcision with HA filler, collagen filler, and skin boosters, as well as full-face CO2 fractionated laser treatment, are some of the representative methods, we also offer CynoGlow, which combines Potenza with PicoSure Pro, and Skin ReGeneration, which combines PicoSure Pro with Sofwave. Of course, these treatments alone cannot address all types of acne scars. However, CynoGlow and Skin ReGeneration are highly requested by many patients as they can treat various types of acne scars with minimised downtime. Additionally, home care is an important part of acne treatment, so we often create our own



original skincare products at our clinic and combine them with device treatments.

## Nutrition/gut health seems to be a factor for many acne patients – how do you include this in your treatment plans?

At our clinic, we use prebiotics (not probiotics) and fermented products to correct disturbances in the gut microbiome. Particularly for fermented enzymes, we prescribe 'Sakiwai Koso,' a product developed by our clinic, which has shown effectiveness against acne. Sakiwai Koso is recognised for enhancing NK cell activity and improving microcirculation, and it is highly regarded not only as part of acne treatment but also as a component of overall well-being.

## What is your go-to device when treating acne?

If there are pustules with deep inflammation, we use Potenza with the single needle mode. Potenza is an ideal treatment for sedating strong inflammation while remodelling the surrounding tissue. When there are many superficial pustules

with pigment deposition, we often use PicoSure Pro, especially with fractional hand piece. This is because treatments using LIOB (Laser Induced Optical Breakdown) are suitable for the superficial dermal remodelling and epidermal reconstruction.

## What are your favourite features of the PicoSure Pro and Potenza devices?

My favourite features of the PicoSure Pro are the adjustable fluence / diameter and irradiation parameters, as well as the fractional irradiation mode. The former allows for finely tuned settings according to the operator's preference based on the target depth and density, achieving high efficacy in colour removal while minimising the occurrence of Post-Inflammatory Hyperpigmentation (PIH). The latter is because, with LIOB in the epidermis, not only the epidermis but also the dermis can be remodelled. This combination of features is not available in other picosecond lasers.

My favourite feature of Potenza is its ability to divide RF irradiation into pulses. The operator can choose whether to deliver the entire energy in one pulse or to deliver the same energy in a series of shorter two to five pulses. These two devices stand out from others in their ability to tailor settings according to the specific skin conditions. Both are indispensable in my practice.

For more information, visit [CYNOSUREAUSTRALIA.COM](https://www.cynosureaustralia.com)

# Unlock Japan's Anti-Ageing Secrets: how Japanese skincare innovations are transforming Australian beauty routines.

## *The Revolutionary Methods Australians Can Adopt from a Japanese Skin Expert*

Dr. Kentaro Oku, leading dermatologist and founder of HILLS GRACE CLINIC in Yokohama, Japan, is pioneering a revolutionary approach to skin health, bridging cultural techniques and modern science to benefit Australian skin health.

Dr. Oku says the cornerstone of Japanese skincare is the use of lotion as the first step, which is crucial for maintaining a flawless complexion through intense moisturisation.

"While the Australian approach focuses on protection and recovery, particularly from environmental damage, the Japanese approach is about regeneration and nurturing. But these days, the approaches vary as there's a trend of self-skin care using overseas products," Dr Oku says.

Dr. Oku also dispelled a common skincare myth in Australia; that UV protection is only necessary during direct exposure to UV light.

"It is imperative to practice UV care 365 days a year, regardless of whether it is sunny or overcast, or even when indoors. It's very important to recognise the need for broad spectrum light care, especially in today's age where we are also exposed to blue light from smartphones and PCs," Dr Oku says.

"The intense UV exposure in Australia has a big impact on not only the epidermis but also the dermis; this results in collagen damage in the dermis and tends to dry out the epidermis. That's where strategies targeting the dermis and epidermal moisturisation are critical for revitalisation."

Dr Oku recommends a basic dermatological care routine that Australians could adopt from Japanese practices to improve their skin health.

"Prior to using energy-based device treatments, it's crucial to establish a period of four weeks for skin

priming, using low-concentration retinol in your daily care routines," Dr Oku says.

One of Dr. Oku's groundbreaking innovations, CynoGlow, combines pigment correction with dermal regeneration in a single session, offering a holistic approach to skincare that promises luminosity and elasticity.

"This dual approach is perfectly suited for the Australian climate, where UV exposure is a major concern," Dr. Oku says.

The dermatologist has reflected on how cultural perceptions influence skincare.

"In Japan, there's a high value placed on pale, translucent skin, which drives the popularity of whitening products. This contrasts with Australian beauty standards, which are more diverse and influenced by environmental factors."

Dr. Oku anticipates that the future of skincare will focus on multi-functional treatments that address several concerns simultaneously, a trend he believes will resonate globally.

### About Dr. Kentaro Oku:

Dr. Kentaro Oku is a graduate of Fukushima Medical University and the founder of HILLS GRACE CLINIC and HILLS GRACE: Research and Training Institute of Aesthetic Medicine. He is an esteemed member of the Japanese Dermatologist Association and The Society of Aesthetic Dermatology. Dr. Oku is recognized globally for his contributions to dermatology and aesthetic medicine.







cynosureap@outlook.com

Cynosure Aesthetic and Medical APAC Services Pte Ltd

 cynosure\_apac  cynosure-asiapac

©2024. Cynosure, LLC. All rights reserved. Cynosure is a registered trademark of Cynosure, LLC.



**CYNO\URE®**  
BEAUTIFUL ENERGY