AMERICAN SOCIETY FOR LASER MEDICINE AND SURGERY

2018 ELECTRONIC POSTERS (ePOSTERS) TOWN HALL AND ePOSTERS

ePOSTER TOWN HALL: *BODY CONTOURING*

A NOVEL NON-INVASIVE TECHNOLOGY BASED ON SIMULTANEOUS INDUCTION OF CHANGES IN ADIPOSE AND MUSCLE TISSUES: SAFETY AND EFFICACY OF A HIGH INTENSITY FOCUSED ELECTRO-MAGNETIC (HIFEM) FIELD DEVICE USED FOR ABDOMINAL BODY SHAPING

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Background: Current approaches to non-surgical abdominal contouring are represented by fat reduction technologies inducing thermal effects (radiofrequency, cryolipolysis, laser). These are ideal for patients with fat bulges/overall abundance. Our study investigates effects of a novel approach which affects both the subcutaneous adipocytes and the underlying muscle structure in a non-thermal manner, as a new way of treating lower-to-medium BMI patients.

Study Design/Materials and Method: 22 patients (avg. BMI 23.8 $kg \cdot m^2$) received four 30-min treatments using a non-invasive High Intensity Focused Electro-Magnetic (HIFEM) field device. The therapy was applied on abdomen, inducing supramaximal contractions of musculus rectus abdominis, obliquus externus and obliquus internus. No anesthesia was applied. Weight and waist measurements as well as photographs were taken at the baseline and at 3-month follow-up. Patient satisfaction was evaluated using questionnaires. Photographs were given to blinded evaluators for recognition. All data was tested by t-tests.

Results: 19 patients completed the study. The average waist size was reduced by 4.37 ± 2.63 cm ($p < 0.01$) at 3 months. In 89.47% of cases the evaluators successfully recognized the before image from the 3-month image. Patients reported their abdominal appearance has improved (91%), that they're satisfied with treatment results (96%), and that they'd recommend the treatment to a friend (92%). No adverse events occurred.

Conclusion: We focused on significantly lower-BMI patients (avg. 23.8 $kg \cdot m^2$) than most studies published on other body shaping devices. With this consideration, the average waist reduction represents a highly competitive result. Subjects showed a combination of reduction in fat and muscles remodeling. The additional muscle strengthening effect was critical in achieving improvement in patients with less subcutaneous fat. The device represents a new modality for body contouring with primary application on lower and medium BMI patients. It's a new extension to current devices only targeting adipose tissue.

CARBOXYTHERAPY FOR SUBCUTANEOUS ABDOMINAL FAT REDUCTION: A RANDOMIZED CONTROLLED TRIAL

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Background: There are now many available treatments for subcutaneous fat reduction. Non-invasive fat removal treatments are appealing to patients because of the ease of recovery and less adverse events compared to invasive methods. Carboxytherapy is the insufflation of carbon dioxide gas into the skin layers, and one potential non-invasive treatment for fat reduction. The efficacy of carboxytherapy for the reduction of subcutaneous fat in the *abdomen* area will be evaluated in this study.

Study Design/Materials and Method: This was a randomized, sham-controlled, double-blind, split-body study. Adult participants who met inclusion and exclusion criteria were enrolled. One side of the body was randomized to receive infusions of 1000 cc of CO_2 every week for 5 weeks in the flank region, while the contralateral side received sham treatments. Outcomes measured were fat layer thickness using a diagnostic ultrasound, total circumference, and body weight.

Results: 16 participants completed the study. There was a significant difference in fat thickness one week after the last treatment ($p = 0.011$) with the carboxytherapy side working better, but this difference was not maintained at 28 weeks as measured by diagnostic ultrasound. Total circumference decreased nominally but not significant. Body weights did not significantly change throughout the study.

Conclusion: Carboxytherapy may provide a small but transient decrease in subcutaneous fat. Unfortunately, this effect did not last for a meaningful period of time after the treatment was stopped.

CLINICAL STUDY TO ASSESS A 1060 nm HYPERTHERMIC DIODE LASER FOR THE TREATMENT OF CONTOUR DEFORMITIES POST LIPOSUCTION

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Background: Liposuction has become increasingly popular in the past decade due to advances in technique and technology. Although successful for the most part, there is a population of patients who have contour deformities post-surgery. The 1060 nm non-invasive diode laser has been approved for the removal of unwanted fat, so it was theorized that it could be used to even out these areas of deformities.

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Study Design/Materials and Method: This study was designed to retrospectively study the clinical changes induced by a 1060 nm diode system on contour deformities in tissue post liposuction. 15 patients with contour deformities post liposuction (minimally 6 months post-surgery) were treated in the area of the deformity with the noninvasive hyperthermic 1060 nm diode. Each patient received 2 treatments at a 6-week interval in the anatomical area of their contour deformity.
Results: Although this is technically a retrospective study based on treatment schedules, some patients are still in follow up. At the time of submission, 10 of 15 patients had completed 2 treatments and the necessary follow up to be included in these results. Two blinded evaluators could correctly identify the pretreatment image compared to the post treatment image in an average of 85% of subjects. 100% of the patients were graded to be at least "Improved" with an average of 50% of subjects being "Much Improved" and an average of 40% of subjects being "Very Much Improved". Patient satisfaction was "High" in all subjects who have completed the treatment protocol. There were no unanticipated adverse events or complications.
Conclusion: The noninvasive hyperthermic 1060 nm diode system is safe and highly effective in the treatment of contour deformities post liposuction.

COMPUTED TOMOGRAPHY (CT) BASED EVIDENCE OF SIMULTANEOUS CHANGES IN HUMAN ADIPOSE AND MUSCLE TISSUES FOLLOWING A HIGH INTENSITY FOCUSED ELECTRO-MAGNETIC FIELD (HIFEM) APPLICATION: A NEW METHOD FOR NON-INVASIVE BODY SCULPTING

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Background: We investigated the effects of a novel non-invasive device utilizing non-thermal technology for induction of changes in patient's subcutaneous adipose tissue (SAT) and abdominal wall muscle. Morphologic changes in SAT and rectus abdominis muscles were evaluated by computed tomography (CT) following a series of treatments with this novel non-thermal technology.
Study Design/Materials and Method: We treated 16 male and female subjects (aged 34 to 64, mean BMI 23.4kg · m-2) using a High Intensity Focused Electro-Magnetic (HIFEM) field device. Subjects underwent CT scanning at baseline and 1 month after five to eight 30-minute abdominal treatments administered bi-weekly. Changes in subcutaneous fat and abdominal muscle thickness were calculated from the same subumbilical and epiumbilical CT cuts, respectively, using midsternal and lateral measurement points. Data collected included standardized photographs, and circumference measurements taken throughout the study. Patients were instructed to maintain their routine diet and activity level without any modifications. All patients completed a standardized questionnaire regarding their treatments
Results: Comparing patient baseline to follow-up measurements, CT data showed on average $19.2 \pm 9.7\%$ reduction in subcutaneous fat and simultaneous $15.8 \pm 10.1\%$ thickening of rectus abdominis, and patients lost on average 1.64 ± 1.35 inch off their waist. Most of the waist reduction effect was achieved already after 4th treatment. All results proved highly significant ($p < 0.01$) while weight change was insignificant. Digital photographs showed aesthetic improvement in most patients. The treatments were painless and without adverse events.
Conclusion: Results suggest that the investigated device is effective for abdominal body sculpting. CT scans documented improvement in both SAT and rectus abdominis muscle. This method delivers improvement in two tissues (fat and muscles), thus allows practices to treat a wide range of patient profiles. It has very low risk profile stemming from its non-thermal technology. Data suggest 4 treatments as the ideal protocol.

HIGH INTENSITY FOCUSED ELECTRO-MAGNETIC THERAPY (HIFEM) EVALUATED BY MAGNETIC RESONANCE IMAGING (MRI): SAFETY AND EFFICACY STUDY OF A DUAL TISSUE EFFECT BASED NON-INVASIVE ABDOMINAL BODY SHAPING

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Background: Physicians are facing increasing demand for body contouring, creating pressure for emergence of innovative methods to deliver aesthetic improvement non-invasively to a wide range of patients. This study evaluates the efficacy of a High Intensity Focused Electro-Magnetic (HIFEM) technology for abdominal body shaping as a new way of treating patients in aesthetic practices.
Study Design/Materials and Method: In total 13 patients (5 female, 8 male, average age 36.0, BMI 24.8 kg/m^2) received 4 treatments over umbilicus, 30 minutes each, separated by 2–3 days. Anthropometric evaluations were recorded and digital photographs were taken. The MRI without contrast determined by vertertebras T12 and S1 (FIESTA and FSPRG sequences) was used to measure fat and abdominal muscle thickness before the treatments and 2 months ($\pm$10 days) after the last procedure, in order to assess anatomical changes in abdominal tissues as a consequence of the application.
Results: All patients tolerated the treatments well with no adverse events. Two patients reported mild muscle fatigue one day after the treatment. Analysis of the same MRI slices verified by tissue artefacts showed a statistically significant average $18.1 \pm 9.1\%$ reduction of adipocyte tissue and $14.4 \pm 7.9\%$ increase in muscle mass ($p < 0.001$), coupled with measurable circumferential reduction. Fat changes were visible in all patients; one patient didn't have any muscle growth reaction. The weight of the subjects didn't change significantly.
Conclusion: MRI considered as a highly precise diagnostic method revealed significant simultaneous muscle growth and fat reduction 2 months post treatments, unrelated with dieting. This suggests the therapy as a unique solution for patients whose aesthetic problem isn't driven by fat mass only, but also by the underlying muscle structure. This positions the treatment next to existing technologies, and opens physicians' access to a completely new segment of patients who aren't ideal candidates for stamping or suction based fat removal treatments.

LIMITED RELEASE TISSUE STABILIZED-GUIDED SUBCISION FOR THE TREATMENT OF MILD-TO-MODERATE CELLULITE OF THE BUTTOCKS AND THIGHS

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Background: Tissue stabilized-guided subcision (TS-GS) has been shown to be effective for improving the appearance of moderate-to-severe cellulite in the buttocks and posterolateral

thighs. Mild-to-moderate cellulite, however, is characterized by shallower dimples and interconnected ripples. Herein we describe the use of smaller focal or limited tissue releases to effectively treat mild-to-moderate dimples on the posterolateral thighs and buttocks.
Study Design/Materials and Method: A retrospective chart review was conducted of all patients in our practice who had undergone TS-GS. Two independent blinded raters, not affiliated with the study, analyzed before and after photos and rated cellulite improvement after treatment on a quartile scale (0 = 0%, 1 = 1–25%, 2 = 26–50%, 3 = 51–75%, and 4 = 76–100%). The buttocks and thighs were assigned separate improvement scores, and a global score was assigned to the overall appearance of the cellulite after treatment.
Results: All patients (23) were female and exhibited cellulite of mild to moderate severity. All subscisions were performed at a fixed depth of 6 mm below the surface of the skin, with a minimum of 3-mm between each dimple/fold. The treating physician administered smaller, focal tissue releases for smaller dimples and folds on the buttocks and thighs. The blinded raters correctly and independently identified which photos represented pre- and post-treatment states in 22 out of 23 patients (95.6%). Among those correctly identified, the raters' combined average cellulite improvement scores were 2.9, 2.8, and 3.1 for the buttocks, thighs, and global appearance, respectively. Overall, the procedure was well tolerated, with no unexpected adverse events reported.
Conclusion: Our study demonstrates significant improvement in the buttocks, posterolateral thighs, and overall appearance of mild-to-moderate cellulite in 95% of patients treated with limited release TS-GS. This technique of uniform treatment of all targeted dimples and folds at a depth of 6 mm, separating each treated area by at least 3 mm, and administering focal, limited tissue releases to smaller dimples/folds is safe and effective in the treatment of mild-to-moderate cellulite of the buttocks and posterolateral thighs.

ePOSTER TOWN HALL: *DEVICE DEVELOPMENT*

BIOLOGICAL EFFECT OF A SHORT-PULSED LASER ON THE INFLAMMATORY RESPONSE AND EXPRESSION OF HEAT SHOCK PROTEINS

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Background: Short pulse lasers have significant advantages for therapeutic applications due to their ability to precisely deliver the desired energy dose with minimal heat spread to surrounding healthy tissues. Heat shock proteins (HSPs) are highly conserved chaperone families that are expressed in response to various biological stresses. Induction of HSP47 can indicate healing of damaged tissues by collagen synthesis. HSP70 is a tissue-damaging indicator and has a protective function for thermotolerance. In this study, the inflammatory response and expression of HSP70 and 47 induced by short-pulsed laser as well as effect of different laser parameter on the expression of these proteins is investigated on the human embryonic kidney cells 293 (HEK 293T) and human cervical cancer cells (HeLa). Also, the expression of HSP70 and 47 will be studied *in vivo* using rat tissues.
Study Design/Materials and Method: HEK 293T and HeLa cells were exposed to the short-pulsed laser irradiation with varying exposure parameter (different power, frequency, and irradiation time) to study the expression of HSP 70 and 47. The extent of thermal damage and healing process on cells were visualized with western blot and immunohistochemical localization over time 2, 6, 8, 12, and 18 hours following irradiation. Expression of TNF-α was used as a marker to study the inflammatory response.
Results: It is expected that expression of TNF-α and HSPs increase initially with time as a result of laser damage and then decrease systematically as the healing process starts. Also the level expression is expected to increase systematically with increasing laser power.
Conclusion: In order to understand the impact of laser irradiation on tissue damage and healing, HSPs are used as a marker. Studying effects of different laser parameters on HSP expression at different times will be beneficial in optimizing the short pulse laser parameters for therapeutic applications.

MULTI-PHASE STUDY FOR THE VALIDATION AND USABILITY OF A NOVEL RADIOFREQUENCY DEVICE

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Background: Radiofrequency (RF) technology is commonly used in surgery, non-invasive treatments and aesthetic applications. Inconsistencies in energy profile, as well as issues with patient comfort have traditionally been negative factors associated with this type of technology. In this multi-phase study we perform a system validation for a novel RF device which incorporates precise temperature sensing and monitoring capabilities, an opto-mechanical tip contacting the patent to ensure safety and comfort due to contact, and a counter giving precise time-at-temperature readings throughout the treatment.
Study Design/Materials and Method: Phase 1- Animal tissue was used to perform a comparison of the thermally affected zones (TAZ) between the novel RF device and the predicate RF device at different power settings. Phase 2- two subjects were treated, and temperature readings from both the device and a thermal camera were compared to ensure accurate temperature sensing capabilities. 10 subjects were treated with the two different devices and the adverse event profile was compared. All treated subjects were used to observe the usability of the system.
Results: Across the three types of animal tissue, the affected tissue was considered substantially equivalent for both devices and it was observed that the TAZ overlapped in each of the tissue areas with at least 2 of the 3 power settings. Across eighteen treatments performed on two subjects, the average temperature difference between the device and the thermal camera was within ± 1.5°C. Adverse events in the 10 subjects assessed were minimal and included erythema and edema lasting an hour on average.
Conclusion: This novel RF device for heating tissue has been shown to be equivalent to a previously approved electrosurgical device in terms of affected tissue. It was proven to be capable of reporting accurate tissue temperature readings providing safety and comfort during treatment.

ePOSTER TOWN HALL: *FACE AND NECK CONTOURING*

3D PHOTOGRAPHY OF SUBMENTAL FAT FOLLOWING TREATMENT WITH 1060 nm NON-INVASIVE DIODE LASER

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Background: Several studies have utilized two-dimensional (2D) photography as a method of evaluating efficacy of fat

reduction. In this study, we employ three-dimensional (3D) photography to demonstrate fat reduction in the submental area after treatment with a 1060 nm diode laser.
Study Design/Materials and Method: A total of 21 subjects were enrolled to evaluate efficacy of the 1060 nm diode laser in reduction of submental fat. Subjects received up to two treatments with the diode laser, and a 3D photography system was used to capture patient images pre-treatment and at 12 weeks post final treatment. To ensure consistency and accuracy in 3D photography, specific landmarks were used for each subject's images. All images were reviewed and analyzed, and contour maps outlining reduction in 3D volume were created through analysis of the 3D data. All subjects also underwent 2D photography and 3D ultrasound measurement of adipose tissue thickness before treatment and at 12 weeks after final treatment.
Results: A clear reduction of fat in the submental area was seen in over 90% of the subjects' 3D photos as demonstrated through volume change in 3D data analysis. These results were comparable to the outcomes from blinded analyses of 2D images performed by board-certified dermatologists. The results also correlated with the subjects' 3D ultrasound measurements of the submental area.
Conclusion: Three-dimensional imaging is a helpful tool for demonstrating fat reduction in the submental area. The analyses of 3D images in this study further validated the efficacy of a 1060 nm diode laser in reducing submental fat.

CLINICAL STUDY TO ASSESS THE SAFETY AND EFFICACY OF A 1060 nm DIODE LASER FOR TREATING THE SUBMENTAL AREA

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Background: Non-invasive fat reduction can occur with temperature alterations as minimal as a 6°C increase above normal body temperature. Lipid bilayer components of the adipocyte cell membranes held together only by forces of hydration, are the most vulnerable to temperature variation. The 1060 nm wavelength has been used for laser lipolysis. The treated adipocytes are generally removed by the human body through the inflammatory clearing process which takes weeks to months. This laser already had approval for non-invasive lipolysis of the abdomen, flanks, back, inner and outer thighs.
Study Design/Materials and Method: Eight subjects were recruited from a pool of healthy male or female volunteers between 20 and 65 years old presenting with significant submental fat and a BMI of $\leq$45. Subjects received 2 treatments (25 minute treatment time for each) and had 12 week follow ups for physician grading based on a 5 point scale. 2D and 3D digital images were taken. A subject satisfaction question was also answered based on a 6 point scale.
Results: The physician assessment of photographs indicated an average score of 4 (much improved) for all eight subjects. No subject scored under a 3. Subject assessments indicated an average score of 2.5 (between extremely satisfied and satisfied). A subset of 3 subjects had digital 2D and 3D image analysis which demonstrated an average improvement of: −21.5% in Lift, −3.0% in Skin Tightening, −5.3% Minor Strain Median measurements and an average reduction of 5.6 cc in volume.
Conclusion: Reduction in submental fat improvement of cosmetic contouring occurred in all subjects. Skin lifting/tightening was quantified in the subject subset which had 3D analysis.

MULTI-CENTER STUDY FOR THE SAFETY AND EFFICACY OF FACIAL PROCEDURES USING A RADIOFREQUENCY DEVICE WITH TEMPERATURE REGULATION

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Background: Radiofrequency (RF) is a commonly accepted treatment modality targeting early signs of skin aging. In this study we examine the safety and efficacy of an RF device, with integrated temperature monitoring, recently FDA cleared as a non-ablative treatment option for mild to moderate facial wrinkles and rhytides.
Study Design/Materials and Method: 25 subjects (Fitzpatrick skin type II–IV) with facial laxity and rhytides were enrolled and received 3–5 full face treatments 2 or 4 weeks apart. Individual zones were treated (forehead, periocular, upper cheek, lower cheek) using either a 20 mm, 15 mm or 10 mm hand piece. The initial target temperature was set to 39°C and increased throughout the treatment. High resolution 2D photographs were taken prior to each treatment and 30, 60 and 90 days post last treatment. Parameters recorded were; energy dosage, temperature, pain, and time. Subjects were assessed for adverse events immediately post-treatment and 1 week post-treatment.
Results: Treatment time ranged from 30–40 minutes. The target temperature of 43°C was achieved by incrementally increasing temperature, aiding subject tolerability. Average pain score was 2.0/1 across all treatment zones. Erythema lasting less than an hour was reported and less than 10% of subjects reported swelling lasting a few hours. All subjects were satisfied with their treatments. Subject noted their skin felt smooth, soft and firm. No additional side effects were noticed in subjects that had 2 week treatment intervals as compared to 4 week intervals.
Conclusion: This new RF device with temperature regulation and an integrated thermistor tip visually improved laxity and rhytides determined through photographic analysis and subject evaluation by achieving and maintaining target temperature for neocollagenesis (42–43°C) with high patient tolerability and minimal downtime in both 2 and 4 week interval patients.

SAFETY AND EFFICACY OF A 1060 nm DIODE LASER FOR THE REMOVAL OF SUBMENTAL FAT

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Background: Non-invasive fat reduction is an efficacious option for body contouring in the flanks, abdomen, thighs and back. In this study we examine a non-invasive laser treatment for fat reduction in the submental area.
Study Design/Materials and Method: Fifty-seven subjects enrolled at 3 study centers and received up to two treatments with a 1060 nm laser on the submental area. High resolution 2D photography was taken before treatment and 12 weeks post final treatment. Subject satisfaction was recorded at the end of the study. Weight was recorded at each subject visit. Adverse events were assessed at all subject visits in addition to phone calls as necessary. All subjects were requested to maintain their standard diet and exercise routine throughout the course of the study. Three blinded evaluators were asked to choose the post-treatment photo from randomized pre- and post-treatment sets.

Results: Of the 57 subjects treated, 55 returned for the 12 week post final treatment follow up. Post treatment photos were correctly identified 93% of the time across all subjects. All subjects were satisfied with their results. A majority of events were mild (75.2%) in nature and transient. The most common events were swelling and tenderness which lasted less than 11 days on average. Subjects reported an average treatment comfort level of 3.3/10.
Conclusion: The use of a non-invasive 1060 nm diode laser is an effective and safe method for fat reduction in the submental area.

SUCCESSFUL TREATMENT OF RHINOPHYMA USING COMBINATION ERBIUM AND CO_2 LASER

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Background: Rhinophyma is a manifestation of longstanding rosacea where the sebaceous glands and connective tissue of the nose become hypertrophied, notably on the distal nose. This causes bulbous swelling and hyperemic large masses of the nasal tip and nostrils. Advanced stage rhinophyma can commonly be seen in men over the age of 40. Although generally benign, the disfigurement can be cosmetically undesirable. Histologic findings include hugely dilated follicles with inflamed sebaceous apparatus and keratin plugging. We report 20 patients with rhinophyma successfully cosmetically treated with combination erbium and CO_2 laser.
Study Design/Materials and Method: Nineteen male patients and one female patient, Skin Types I–III, presented with rhinophyma. The lesions appeared on primarily distal nose. The patients underwent treatment with a CO_2 laser at 30–40 watts, 3 mm collimated spot for debulking to desired shape. A combination CO_2/ Erbium laser was then used with a defocused 0.2 mm spot size at 0.3–0.5 J/cm^2, 50% density of CO_2 with 6 watts of CO_2, in a focused and defocused application. Four blinded observers graded pre- and post-high resolution photographs for therapeutic response.
Results: All four observers correctly chose pre- and post-photographs. There was an average of 92.5% global improvement, 90.9% improvement in bulking, 84.7% texture improvement, and 53.75% improvement in erythema after one treatment session. Adverse effects were erythema and mild edema at the site of treatment, which resolved in 1–5 days. No additional pigmentary changes or scarring were caused by the treatment.
Conclusion: Rhinophyma is a rare complication of advanced rosacea that can be cosmetically distressful to patients, with limited surgery options and variable results. The combination of CO_2 laser provides debulking and fine detail shaping, while Erbium ablates without char, allowing accurate design and clean healing. We report excellent cosmesis of rhinophyma treatment using combination Erbium and CO_2 laser.

SUCCESSFUL TREATMENT OF RHINOPHYMA WITH CO_2 LASER

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Background: Rhinophyma is characterized by soft tissue hypertrophy of nose which leads to functional, cosmetic and psychosocial concerns. The use of CO_2 laser has been well described for the treatment of this disease. We report our experience of treating rhinophyma patients with CO_2 laser at our regional plastic surgery center.
Study Design/Materials and Method: A retrospective study was conducted at the Welsh Centre for Burns and Plastic Surgery, Morriston hospital, Swansea. Clinical data, subjective assessment by senior author and complications of all the patients undergoing CO_2 laser treatment for rhinophyma from 2012–2016 was recorded.
Results: Twenty patients (exclusively male) underwent treatment of rhinophyma. Mean age was 61.7 years and 70% had history of rosacea. 55% had moderate to severe disease at presentation. 70% had cosmetic concerns and 20% had symptoms related to infection. 85% had single CO_2 laser treatment for rhinophyma. Minimal complications were noted. On subjective assessment all patients had good/excellent results following the treatment. Photographic evidence is presented.
Conclusion: CO_2 laser treatment successfully restores the nasal shape and contour. The complications associated with this treatment are minimal.

ePOSTER TOWN HALL: *OPTICAL IMAGING*

A NOVEL STEREOSCOPIC OPTICAL SYSTEM FOR OBJECTIVELY MEASURING ABOVE SURFACE SCAR VOLUME—FIRST TIME QUANTIFICATION OF RESPONSES TO VARIOUS TREATMENT MODALITIES

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Background: Current approaches use subjective semi-quantitative or cumbersome objective methodologies to assess physical characteristics of hypertrophic and keloid scars.
Study Design/Materials and Method: This pilot study aimed to evaluate the accuracy and feasibility of a new stereoscopic optical and high-resolution three-dimensional (3D) imaging system, for objectively measuring changes in above surface scar volume following various interventions. Feasibility of the system was assessed by monitoring the above surface scar volume of five scars in two patients for five successive months. Above surface scar volume and Vancouver Scar Scale (VSS) scores and the investigator and patient volume improvement assessment scores were assessed before and twelve weeks after last intervention.
Results: Scar volume measured by the imaging system correlated significantly with the gold standard (actual weight). The greatest volume reduction followed a combination of cryotherapy and intralesional triamcinolone acetonide and 5-fluorouracil injections in Patient 1, and a combination of pulse dye laser and intralesional triamcinolone acetonide injections in Patient 2.
Conclusion: The new stereoscopic optical system is a valid, accurate and practical objective method for assessing scar volume and for monitoring treatment response. It is more sensitive and accurate than semi-quantitative objective scales. Further studies with a higher number of patients and scars are required to increase the measurement validity of the system.

EVALUATION OF OPTICAL IMAGES FOR SKIN DISEASES *IN VIVO*

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Background: Optical coherence tomography (OCT) is a non-invasive imaging technique that can be applied to diagnose

various skin diseases. In order to accurately diagnose skin diseases, it is essential to develop OCT device that can obtain high quality images. We have evaluated the performance of the developed system and *in vivo* clinical data of skin diseases.
Study Design/Materials and Method: The purpose of our research is to develop a high definition OCT device with high resolution and deep penetration depth for diagnosis of various skin diseases and to increase accuracy in clinical prescription. The developed device was used to compare the depth of skin and epidermis using OCT images and microscopic skin biopsies.
Results: For precise identification of skin tissue, a high-speed line scan camera with 76 kHz axial scan rate was used to improve image acquisition speed. It can acquire image 3.5 times faster than commercial OCT device, and can obtain more real-time images. OCT images were measured using the developed device, and skin biopsies was compared and analyzed to obtain a confidence level of 95% or more.
Conclusion: The results presented in this study considered non-invasive diagnosis of skin diseases as compared to skin biopsies. There are various kinds of skin diseases, and causes are also diverse. Therefore, treatment methods are also diverse. However, before therapy, accurate diagnosis will be can increase the effectiveness of treatment using an imaging device such as OCT.

ePOSTER TOWN HALL: *OTHER RESEARCH TOPICS*

A RETROSPECTIVE CHART REVIEW EXAMINING SCALP MALIGNANCIES AFTER THE INITIATION OF PHOTOBIOMODULATION FOR ALOPECIA

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Background: Photobiomodulation (PBM) uses low-level laser light (approximately 650 nm–678 nm) or light emitting diodes in red or near-infrared wavelengths to induce photochemical reactions at the cellular level. PBM devices were Food and Drug Administration cleared in 2007 for androgenetic alopecia (AGA). Clinical trials have demonstrated efficacy; however, long-term safety outcomes remain to be elucidated. We aimed to examine whether PBM use in alopecia increases the risk of developing cutaneous malignancies within the area treated.
Study Design/Materials and Method: A retrospective chart review using a repository containing electronic medical record data from the University of Minnesota was performed. Records from 2007 to current with an alopecia diagnosis and search terms associated with PBM were identified. Estimated treatment number, skin cancer type and location, immunosuppression, and ultraviolet phototherapy were recorded.
Results: Three hundred twenty-one patients met search criteria (247F, 47M, ages 16–78 years). Of these, 133 began PBM and returned to clinic at least once. Alopecia diagnoses were as follows: 56 AGA, 8 alopecia areata, 14 telogen effluvium, 9 frontal fibrosing alopecia, 13 lichen planopilaris, 14 non-scarring alopecia, 2 central centrifugal scarring alopecia, and 13 with combination alopecia. Months of treatment ranged from 0–89 (average = 21.4). Two cutaneous malignancies developed on/near the scalp: one forehead unknown type of non-melanoma skin cancer (latency of 12.5 months); one scalp basal cell carcinoma (latency of 60 months). Both skin cancers occurred in patients with a prior history of non-melanoma skin cancer. Only laser diode containing devices were identified.
Conclusion: We found a very low rate of skin cancer occurrence in our population with alopecia using PBM. This preliminary data does not suggest that PBM results in an increased rate of skin cancer over the time-period examined. Cutaneous malignancies may take many years to develop, so longer term studies with a control group comprising patients with alopecia will be needed to fully elucidate the risk.

IMPROVING THE PATIENT EXPERIENCE THROUGH THE DEVELOPMENT OF PATIENT-CENTERED LASER CARE PLANS

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Background: Laser treatments have safety risks that may be avoided with the implementation of standardized laser safety procedures. While preliminary laser safety processes are often in place at large academic centers, there are often no means of evaluating staff compliance. The aim of this project was to implement standardized laser safety protocols within a large academic multisite dermatology clinic and achieve a staff compliance of at least 95% within six months, without a significant change in clinic efficiency.
Study Design/Materials and Method: Standardized safety protocols were created for five different lasers, including rooming checklists, timeout, goggle identification, room signs, and device preparation and maintenance. Staff training, onboarding, pre-laser eye checks, and competency checklists were also developed. Baseline laser clinic processes, compliance, and the time spent in room with the physician (measured using an automated patient tracking system) were mapped and reassessed 90 days after the above interventions.
Results: A total of 34 patient times were recorded. Of these, 31 laser procedure audits were performed (23 in clinic #1, and 8 in clinic #2). Staff compliance exceeded 98% for all laser protocols, with no significant difference between either clinic ($p = 0.23$). Mean patient times with the physician were reduced to 13.8 ± 7.8 minutes from the baseline of 14.5 ± 10.8 minutes ($n = 74$), though this difference was not statistically significant ($p = 0.372$).
Conclusion: Following implementation and standardization of new safety protocols, both the compliance rate and patient times with the physician exceeded initial goals. Despite additional laser clinic protocols and processes, an increase in patient times with the physician was not seen. The high compliance rate demonstrates that laser safety process changes can be readily adapted in large academic Dermatology clinics in an efficient manner.

ePOSTER TOWN HALL: *PIGMENTED LESIONS AND ANOMALIES*

AN AUTOMATED MOLE RANKING SYSTEM (MOLELIST) FOR SKIN CANCER SCREENING

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Background: Recent work has demonstrated that the specificity of clinical visual skin examination for skin cancer screening is substantially improved when the dermatologist conducts an intra-patient assessment, i.e., considers the

appearance of a mole relative to the patient's other moles. However, dermatologists have to conduct clinical visual skin examinations very quickly given the practical constraints on the time available per patient visit. This limits the dermatologist's ability to conduct an intra-patient assessment and find 'ugly duckling' lesions which are different from other lesions on the patient and typically at higher risk for malignancy. Thus, we propose an automated mole ranking system (MoleList) that provides the dermatologist with a visual list of the patient's moles, sorted from most to least actionable, to assist in skin cancer screening. Mole A is more "actionable" than Mole B if an action other than routine monitoring is more likely to be taken for Mole A than for Mole B.

Study Design/Materials and Method: A proof-of-concept demonstration was performed on a small set patients ($n = 11$), for which dermoscopic images of at least 5 of their moles were available in their medical record. We extracted features from each mole image and used a linear regression model with leave-one-participant-out cross-validation to predict the actionability ranking.

Results: The actionability ranking predicted by the MoleList system compared favorably to the actionability ranking produced by an experienced dermatologist, both by visual assessment of the images and quantitatively in terms of a weighted correlation measure that accounts for the fact that it is more important to correctly rank the actionability of the most actionable moles than the least actionable moles.

Conclusion: This study shows initial promise of an automated mole ranking system that could improve the efficiency and specificity of clinical visual skin examination for skin cancer screening.

COMBINATION LASER THERAPY AND TOPICAL HYDROQUINONE DRUG DELIVERY IN THE TREATMENT OF MELASMA

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Background: Melasma is a common dermatologic discoloration of brown to gray-brown patches that appear primarily on the cheeks, bridge of the nose, forehead, chin, and upper lip of adults, particularly in women. It results from the production of excess pigmentation due to homeostatic dysregulation. Topical treatments such as hydroquinone and corticosteroids may be used alone, but laser therapies are preferred for persistent cases due to the condition's recurrent and refractory nature.

Study Design/Materials and Method: In order to further understand the safety and efficacy of laser therapy and hydroquinone drug delivery, the medical records at a dermatology practice were reviewed for all melasma patients who underwent this combination procedure. Two blinded reviewers assessed the improvement in pigmentation and skin texture as mild, moderate, good, or excellent, and significant trends were identified using regression analyses in StataMP version 14.

Results: A total of 43 patients who underwent an initial laser therapy with adjuvant hydroquinone or triluma were followed for an average of 3.5 months. Of these patients, the majority ($n = 41$) were females, and identified as either Asian ($n = 17$), Hispanic ($n = 17$), or White ($n = 9$), averaging 45 years of age. For all measures, reviewers agreed within one degree of assessment. Overall, patients demonstrated moderate improvements in both pigmentation and skin texture. Asians experienced slightly poorer outcomes overall as compared to Hispanic or White patients, whereas older patients experienced significantly better outcomes ($p < 0.05$). There were no complications.

Conclusion: This data suggests that laser therapy combined with a topical bleaching agent is useful in the treatment of melasma in terms of producing improvements in pigmentation and skin texture, but that results are more likely to be promising in non-Asian and older patients. The combination of laser therapy and topical hydroquinone drug delivery in the treatment of melasma is safe and effective in this group of patients.

EVALUATION OF A NOVEL DERMAL CRYOTHERAPY SYSTEM FOR THE TREATMENT OF BENIGN PIGMENTED LESIONS IN ASIAN PATIENTS

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Background: Photoaging in Chinese often presents with benign pigmentary lesions. Various light based devices have been used for the management of benign pigmentary lesions, such as long pulsed Nd:YAG laser, Q-switched laser and picosecond laser. All of these light-based devices have risk of post-inflammatory hyperpigmentation. The objective of this study is to assess the efficacy of a dermal cooling system to reduce pigmentation in benign pigmentary lesions in Asian patients.

Study Design/Materials and Method: Up to 100 Asian male and female subjects above 18 years of age with good past health are recruited. They have at least one benign pigmentary lesions on their face. Standardized photography is taken at baseline, one month post treatment and 2, 6, 12 months after final treatment. Up to 3 treatments at one month interval is given. The treatment area and parameter is determined by the physician after assessment. The end point is *via* patient real time feedback in terms of a change in sensation. Any adverse effect is recorded. Standardized photographs are assessed by two independent physicians. Subjective assessments are recorded at follow up visits.

Results: The study is ongoing with 25 subjects undergoing treatments. 36% has lentigines only, 36% has freckles only and 28% has both lentigines and freckles. A total of 267 treatment sites have been carried out. 20 subjects have reached one month follow up; 57.5% has improvement objectively by GAIS score and 90% reported improvement subjectively. No adverse effects were recorded.

Conclusion: The novel cryotherapy device is promising for the treatment of benign pigmentary lesions in Asians.

ePOSTER TOWN HALL: *TOPICAL DRUG AND DEVICE DELIVERY*

COMPARATIVE EFFECTIVENESS OF TWO TOPICAL LIDOCAINE MIXTURES TO REDUCE PAIN DURING A NON-ABLATIVE LASER PROCEDURE: A RANDOMIZED CONTROLLED TRIAL

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Background: Topical anesthesia is used to reduce pain and increase comfort associated with minor procedures, including laser treatment. Both lidocaine-tetracaine (LTTA) and lidocaine-prilocaine (LPTA) are topical lidocaine mixtures used commonly

before laser dermatology procedures. Unfortunately, data is lacking regarding comparative effectiveness of the topical lidocaine mixtures during common non-ablative laser procedures.
Study Design/Materials and Method: This is a cross-sectional, split-face and -body, parallel-group randomized control trial. The purpose of this study was to compare the clinical effectiveness of topical LTTA versus LPTA for pain relief prior to non-ablative laser treatment. Healthy, adult females with Fitzpatrick phototype I–III and moderate lentigines or photodamage were enrolled. Participants were randomized to 30 min pre-treatment with LPTA, 7%-7% LTTA, or a placebo vehicle (PV) to six areas prior to Q-switched laser treatment. The pre-treated areas were the right and left foreheads, cheeks, and inner arms. The primary outcome was pain with laser treatment measured by visual analog scale.
Results: 24 participants completed the study. Reported side effects were redness and swelling that resolved within one week of treatment. Pain scores for the three pre-treatments were significantly different on the forehead ($p = 0.0051$), cheek ($p < 0.0001$), and arm ($p = 0.05$). Pairwise analysis revealed significantly lower pain scores with LTTA compared to placebo at all three anatomical sites, while LPTA had only significantly lower pain scores compared to placebo on the cheek. There were no significant differences in reported pain between LPTA and LTTA.
Conclusion: Pre-treatment with LPTA and LTTA were both effective at reducing pain associated with non-ablative laser treatment. LTTA was more effective at reducing pain on many areas of the body with a 30 min incubation time compared to placebo. LPTA was only effective at reducing pain after 30 min incubation on the cheek, which is lower than the 60 min incubation time recommended by the manufacturer.

FRACTIONAL LASER-ASSISTED PERCUTANEOUS DRUG DELIVERY *VIA* TEMPERATURE-RESPONSIVE LIPOSOMES

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Background: Liposomes are used for transdermal delivery of drugs and vaccines. Our objective was to develop temperature-responsive (TR) liposomes to achieve temperature-dependent, controlled release of an encapsulated drug, and use fractional laser irradiation to enhance transdermal permeability of these liposomes. Effect of temperature on liposome size and drug release rate was estimated at two temperatures. Transdermal permeation through hairless mouse skin, with and without CO_2 fractional laser irradiation, and penetration into Yucatan micro-pig skin were investigated using Franz cell and fluorescence microscopy.
Study Design/Materials and Method: Dynamic light scattering showed that mean liposome diameter nearly doubled from 190 nm to 325 nm between 37 and 50 °C. The rate and amount of OVA-FITC released from TR-liposomes were higher at 45 °C that those at 37 °C. Transdermal permeation of OVA-FITC across non-irradiated skin from both TR- and unmodified liposomes was minimal at 37 °C, but increased at 45 °C. Laser irradiation significantly increased transdermal permeation of both liposome groups at both temperatures.
Results: Fluorescence microscopy of frozen biopsy specimens showed deeper penetration of FITC from unmodified liposomes compared to that from polymer-modified liposomes. Rhodamine accumulation was not observed with polymer-modified liposomes at either temperature. Temperature-dependent controlled release of an encapsulated drug was achieved using the TR-liposomes. However, TR-liposomes showed lower skin permeability despite higher hydrophobicity.
Conclusion: Fractional laser irradiation significantly increased the transdermal permeation. Additional studies are required to control liposome size and optimize transdermal permeation properties.

SAFETY OF PERFLUORODECALIN-INFUSED SILICONE PATCH IN PICOSECOND LASER-ASSISTED TATTOO REMOVAL

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Background: Use of a perfluorodecalin (PFD)-infused silicone patch has been shown to enable multiple laser passes in a single treatment session safely and effectively during laser-assisted tattoo removal with a 755 nm QS alexandrite laser. Quantitative analyses have shown that exposure of PFD patch samples to additional QS and picosecond lasers does not alter the optical transmission or chemical stability. The purpose of this retrospective chart review was to assess the safety of treating tattoos with picosecond lasers using multiple passes with PFD patch.
Study Design/Materials and Method: Retrospective study of consecutive patients treated using picosecond lasers in combination with the PFD patch. Information extracted from the medical records included patient demographics, treatment location, tattoo characteristics, laser treatment parameters, and adverse events.
Results: Forty-five patients (16 males, 29 females) included in the study had a mean age of 35.5 years. Patients with Fitzpatrick skin types I–V were represented. The distribution of tattoos included 2 on the neck, 15 on trunk, 20 on upper extremities, and 8 on lower extremities. The mean number of passes per treatment session was 2.6 (range of 1–4 passes). Twenty-nine (64.4%) patients had black tattoos, and the remaining patients had multicolor tattoos with mixtures of black, blue, green, red, and yellow ink. Twenty-eight (62.2%) patients had at least two picosecond laser treatment sessions with PFD patch. Laser tattoo treatments with multiple passes using the PFD patch were well tolerated and effective. No dyspigmentation, scarring, textural changes, or unanticipated adverse events directly related to the treatment were observed.
Conclusion: Multiple passes with 755 nm and 532 nm picosecond lasers may be safely used in combination with PFD patch to treat unwanted black or multicolor tattoos on different body sites in patients of diverse Fitzpatrick skin types. Notably, there were no unexpected treatment-related adverse events, including post-treatment dyspigmentation.

ePOSTER TOWN HALL: *TREATMENT OF SUPERFICIAL CUTANEOUS LESIONS*

EVALUATION AND COMPARISON OF VARIOUS LASER MODALITIES FOR THE TREATMENT OF SEBORRHEIC KERATOSES

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Background: Seborrheic keratoses are benign growths on the skin that are a common cosmetic concern for patients. Standard therapies for these lesions include cryotherapy, shave excision

and electrosurgery, which are effective, but can cause scarring, pain, and dyschromia. Laser therapy offers a promising treatment option for seborrheic keratoses. Our study compares seven distinct lasers for the treatment of seborrheic keratoses on the back with cryotherapy as a "control" to determine which treatment options are safe and efficacious.
Study Design/Materials and Method: This was a case study of one patient, Fitzpatrick skin type II, who had symmetric seborrheic keratoses on the entire back. A 2 by 4 grid was drawn on the patients back to produce 8 squares, each with a minimum of 8 seborrheic keratoses. Seven different laser devices were used to treat all of the seborrheic keratoses in each square in a single treatment, and one square was treated with cryotherapy for control.
Results: Preliminary results 30 days post-treatment show the most improvement in seborrheic keratoses with the fractional CO_2 laser (70%), Er:YAG 2940 nm laser (70%) and 1927 nm thulium fiber laser (50%) as assessed by two blinded investigators. There was less improvement with the 1064 nm picosecond laser (40%) and Q-switched 755 nm alexandrite laser (30%). Both the 755 nm picosecond and cryotherapy had 20% resolution of seborrheic keratoses. No major adverse events were reported with any of the treatment modalities.
Conclusion: Long term follow-up will be presented.

PHOS-ISTOS CLINICAL TRIAL: A NEW SOLUTION FOR PHOTODYNAMIC TREATMENT OF ACTINIC KERATOSIS WITHOUT PAIN

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Background: Actinic keratosis (AK) are common precancerous skin lesions which mainly affect the elderly population. The lesions are usually present on the scalp of the patients and thus are easily reachable by light, making PDT one of the first line treatment. The planar shape of current light sources used for photodynamic therapy (PDT) of actinic keratosis lead to inhomogeneous light distribution on lesions located on curved parts, such as the scalp. Moreover, PDT is known to be very painful.
Study Design/Materials and Method: Resulting from a European project, PHOSISTOS, based on light emitting fabrics (LEF) was developed to overcome those drawbacks. This helmet consists of a 3D printed frame and a patented flexible structure composed of knitted optical fibers. Besides its original design, the project aims to demonstrate that an illumination performed 30 minutes after 5-ALA application, with a low irradiance (1.33 mW/cm^2) during 2h30, and a reduced fluence (12 J/cm^2) is as efficient as the conventional protocol and less painful: illumination 3 hours after 5-ALA application, 75 mW/cm^2, 37/cm^2. PHOSISTOS device was assessed in a comparative (split face intra-individual comparison), randomized, phase II study that takes place in France and in Germany. The main objective was to show the non-inferiority of PHOSISTOS device compared to the conventional PDT. One of the secondary objectives was also to show a significant pain reduction on the PHOSISTOS side. 42 patients with at least 10 actinic keratosis of the scalp and forehead were included.
Results: Preliminary results had shown that PHOSISTOS is effective in the treatment of AK of the scalp with pain scores much lower than the conventional protocol (0.7/10 vs. 7.3/10). Final results of the European project study will be presented.
Conclusion: PHOSISTOS could offer an effective and well tolerated alternative to LEDs for the treatment of AK by PDT. An ambulatory version of the PHOSISTOS device can be easily developed.

ePOSTER ONLY

3D ULTRASOUND IMAGING OF PELVIC PROLAPSE

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Background: Pelvic organ prolapse (POP) is commonly associated with postpartum levator sling tears which are difficult to image on MRI.
Study Design/Materials and Method: 23 females over a 5 year period were imaged with translabial volumetric 3D imaging. Scans were performed with and without Valsalva maneuvers to measure degree of bladder descent and presence of tear in the attachment of the levator muscle to the pelvic sidewall. Study was performed by one investigator with 14 years experience.
Results: Pelvic partial or complete disruptions in the levator sling were noted in 4/23 patients. Associated prolapse of bladder, cervix or anal structures were documented contemporaneously.
Conclusion: 3D translabial sonogram imaging is a cost effective and non invasive diagnostic modality to document levator muscle tears.

A CASE OF INCREASED COLLAGEN VII EXPRESSION AFTER FRACTIONAL ABLATIVE LASER TREATMENT IN RECESSIVE DYSTROPHIC EPIDERMOLYSIS BULLOSA

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Background: Recessive dystrophic epidermolysis bullosa (RDEB) is a genetic skin disorder resulting in severe skin fragility, frequent blisters, scarring, increased risk of squamous cell carcinomas and decreased life expectancy. RDEB results from autosomal recessive mutations in type VII collagen, which is a critical component of the basement membrane. Skin fragility can predispose patients to great morbidity and effective methods to prevent and treat these lesions are limited.
Study Design/Materials and Method: We report the case of a 27-year-old woman with a mosaic phenotype of RDEB who presented for management of large non-healing chronic erosions on her upper back and posterior neck. These areas were treated with deep fractional carbon dioxide (CO_2) laser, which has been shown to help with collagen remodeling in other clinical scenarios. Immediately after treatment, topical poly-L-lactic acid (PLLA) was placed on the skin surface to act synergistically with the laser. Additionally, punch biopsies were performed to compare the collagen distribution in treated and untreated skin.
Results: After seven treatments, she has had great clinical improvement with decreased bleeding during the procedure and decreased frequency of blistering. On hematoxylin and eosin staining, the untreated skin had abnormal collagen organization whereas the treated skin demonstrated a collagen distribution akin to normal skin. Furthermore, a

Herovici stain was performed to differentiate mature (type I) versus immature (type III) collagen, with a notable shift in expression patterns between the treated and untreated samples. Samples were also evaluated for direct immunofluorescence for type VII collagen, which confirmed that the treated samples had increased type VII collagen compared to the untreated sample.
Conclusion: This case illustrates the potential for fractional CO_2 laser in combination with PLLA to aid in the normalization of collagen and the potential for a "mechanical" treatment to increase activity of collagen VII in select patients with RDEB.

A PILOT STUDY ON THE COMBINED USE OF NON-ABLATIVE UNIPOLAR RF AND ABLATIVE FRACTIONAL CARBON DIOXIDE LASER 1064 nm ON UPPER LID PTOSIS AND PERIORBITAL WRINKLES IN ASIAN PATIENTS

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Background: In most Asians the aging eye area always presents with wrinkling of the skin and upper lid ptosis. Upper lid ptosis refers to drooping of the upper eyelid of one or both eyes. The droop may be barely noticeable, or the lid can descend over the entire pupil. Ptosis can affect both children and adults, but usually occurs because of aging, this prompts patients to seek doctors consult. Each year approximately 100,000 people choose to have cosmetic surgery of the eyelids, the gold standard of treatment is surgical Upper Blepharoplasty, this surgical technique may have complications such as overcorrection, undercorrection, exposed sutures, suture abscess and scarring. Because of this problems, clinicians are actively exploring and combining non-invasive alternatives. In this study we combined non ablative unipolar radiofrequency with ablative fractional carbon dioxide 10,600 nm laser in attempting to address upper lid ptosis and periorbital wrinkles.
Study Design/Materials and Method: Randomized control trial of 20 patients (male and female) was selected, aged 30–50 years old. All subjects had 1 session of non-ablative unipolar RF using eye tip, 450 shots, followed immediately by Fractional CO_2 10,600 nm at 15 mJ with 5% density. Photos and measurement of the Margin reflex distance and Margin crease distance before and 3 months after the procedure was recorded. Data collected tallied, interpreted and statistically analyzed.
Results: A single combined treatment of non-ablative unipolar RF using eye tip and Fractional Carbon dioxide laser around the eye area yielded an average increase in Marginal reflex distance of 0.99 mm mean difference for the right eye and 1.09 mm mean difference in the left eye after 3 months. Marginal Crease Difference mean average for the right eye is 0.99 mm increase and 0.98 mm increase on the left after 3 months. All patients manifested both increase in MDR1 and MCD. All patients observed significant degrees of skin tightening, texture improvement and wrinkle reduction in the eye area. Statistical data analysis using paired T-test collected was significant
Conclusion: This study proved that combined treatment of non-ablative unipolar RF using eye tip and fractional carbon dioxide laser around the eye area showed a statistically significant improvement in upper lid ptosis based on marginal reflex distance and marginal crease distance. Skin tightening, texture improvement and wrinkle reduction was observed by all patients.

BLINDED COMPARISON TRIAL OF LIDOCAINE 4% AND BENZOCAINE 20% IN A NOVEL TRANSDERMAL DELIVERY SYSTEM VERSUS COMPOUNDED LIDOCAINE/TETRACAINE (23%/7%) FOR PAIN MITIGATION DURING MICROFOCUSED ULTRASOUND WITH VISUALIZATION TREATMENT

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Background: The efficacy of various pre-medication strategies for comfort management during microfocused ultrasound with visualization (MFU-V) treatment has not been studied. Here the objective was to compare lidocaine 4% and benzocaine 20% products formulated with a novel transdermal delivery system versus compounded lidocaine 23%/tetracaine 7% (23/7) to mitigate discomfort during MFU-V treatment.
Study Design/Materials and Method: This was a randomized, double-blinded, split-face study. Subjects (n = 14) received 50 mg IM meperidine/25 mg IM promethazine/5 mg oral diazepam 1 hour before treatment. Fifteen minutes before treatment, 1 side of the face was treated with 1 application of 4% lidocaine, followed by 1 application of 20% benzocaine; the contralateral side was treated with 2 applications of 23/7 (to maintain blinding). A blinded clinician assessed numbness (scale from 1 = completely numb to 4 = not numb) before treatment and collected subject pain scores (scale from 0 = no pain to 10 = worst pain) following MFU-V treatment. Adverse events and subjective clinician measures were also assessed.
Results: Fourteen females (mean age 51.7 years) were treated. Mean subject pain scores for 23/7 and lidocaine 4%/benzocaine 20% were 5.6 and 5.7, respectively. Mean numbness scores were similar for 23/7 (2.5) and lidocaine 4%/benzocaine 20% (3.0). All clinicians rated both products as "very easy" to apply. For lidocaine 4%/benzocaine 20% 7.1% of subjects required no pauses during treatment, versus 14.3% of subjects for 23/7. However, more subjects required 4+ pauses with 23/7 (21.4% vs. 7.1%). lidocaine 4%/ Benzocaine 20% was preferred by 78.5% of subjects overall; 35.7% of subjects rated benzocaine 20%/ lidocaine 4% as "Very Effective" versus 7.1% for 23/7. No adverse events were reported.
Conclusion: Lidocaine 4% and Benzocaine 20% formulations utilizing a novel transdermal delivery system perform similarly to a compounded lidocaine 23%/tetracaine 7% product for discomfort mitigation during MFU-V treatment. More subjects reported a preference for lidocaine 4%/benzocaine 20% and rated this novel topical product as "very effective" versus the compounded product.

CASE SERIES: FRACTIONAL ABLATIVE LASER-ASSISTED TOPICAL STEROID DELIVERY IN COMBINATION WITH PDL FOR TREATMENT OF HYPERTROPHIC SCARS

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Background: Hypertrophic scars often cause functional and psychological burden on affected patients. Pulsed dye lasers (PDL) produce selective photothermolysis of the microvasculature of hypertrophic scars. As a result, PDL can

improve erythema and texture of hypertrophic scars especially in their early phase. Fractional CO_2 laser emits beams which absorb water and results in microthermal destruction zones through the stratum corneum, epidermis, and dermis which stimulate scar remodeling and facilitate drug delivery to the dermis.
Study Design/Materials and Method: We report treatment of four patients ages 3–44 with skin Fitzpatrick types I–V suffering from hypertrophic scars on face, trunk, and extremities occurred following burn, acne, toxic epidermal necrosis, and thyroidectomy. Follow up period ranged from 1–5 years. Patients were treated with PDL 595 nm prior to or in conjunction with fractional CO_2 10,600 nm laser. Each fractional CO_2 laser treatment was followed by immediate application of topical triamcinolone acetonide suspension at a concentration of 40 mg/ml. Fractional CO_2 laser settings used were power of 60 watts, pulse width of 200 ms, using a 7 mm × 7 mm hand piece and 4 laser passes over affected areas. Fractional CO_2 treatments were spaced at 3–12 month intervals and were repeated 1–4 times in our patients.
Results: All patients showed significant improvement in scar appearance, erythema, texture, and symptoms following treatments. No significant adverse effects were observed.
Conclusion: PDL can improve erythema and texture of early hypertrophic scar, however results are not optimal. Fractional ablative laser-assisted delivery of topical steroid can offer a safe and effective treatment option for management of hypertrophic scars. Combination of fractional ablative laser and topical steroid therapy optimizes dispersion of steroid molecules with minimal discomfort. Data are limited and more studies are needed to determine safety, optimal treatment parameters, treatment frequency, and steroid dosing.

CLINICAL EVALUATION OF DIAMONDPOLAR APPLICATOR TREATMENT FOLLOWED BY AC DUAL APPLICATOR TREATMENT USING 2 INTENSE PULSED LIGHT WAVELENGTH BANDS FOR FACIAL ACNE VULGARIS

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Background: Acne affects almost 100% of the population, from ages 8 to 80, and is a source of great distress particularly in the adolescent/young adult age group. The clinical presentation ranges from comedonal disease, to red papules and large cysts. The cause is essentially unknown. Several energy-based devices have been tested to treat acne, from laser-light to radiofrequency. Blue/red light with dual bacterioside/anti-inflammatory action has been hypothesized to be effective in reducing acne manifestations. Moreover radiofrequency devices have demonstrated effectiveness in reducing inflammation and preventing scarring. In this study, the efficacy of blue/red light compared to the combination of blue/red light together with radiofrequency to treat acne was examined.
Study Design/Materials and Method: 40 subjects (ages 18–55 years) were enrolled in this multi-center, prospective, open label study. Each subject received 4 full treatments at 1 week intervals. Follow-up took place 6 weeks after the last treatment. Half of the subjects were treated with either blue/red light or blue/red light together with multipolar radiofrequency with pulsed electromagnetic field. The objectives were to evaluate the individual efficacy of facial acne vulgaris treatment with the single or combination treatment, and the subject's assessment of improvement, comfort & satisfaction with the treatments.
Results: Overall all inflammatory lesions responded to both single and combination treatments. Inflammatory lesions responded better to combination therapy compared to blue/red light alone (40% vs. 30%). Both open and closed comedones responded better with the combination therapy. There were no differences in reduction of nodules/cysts between the two groups. Patient self-assessments revealed that single therapy group were more satisfied with their overall appearance and acne appearance compared with the combination group. There were no serious adverse effects, but combination therapy resulted in increased erythema and irritation compared to the blue/red light group alone.
Conclusion: Blue/red light and multipolar radiofrequency with pulsed electromagnetic field treatments are effective and safe for reduction of acne lesions and improvement of patient appearance. Patient satisfaction is increased with blue/red light alone compared to combination therapy.

CLINICAL STUDY OF INTENSE FOCUSED ULTRASOUND THERAPY TO DEEP DERMAL FACIAL SKIN AND SUBCUTANEOUS TISSUES

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Background: Non-ablative skin tightening technologies offer the prospect of reduction of wrinkles and skin sagging with minimal downtime, discomfort, and risk of adverse events. The excellent safety profile is mitigated by the limited efficacy of such procedures. The objective of this study is to evaluate the clinical safety of intense ultrasound in the treatment of the dermis and subcutaneous tissues of the face in terms of skin inflammation, pain and adverse events.
Study Design/Materials and Method: In an open-label study, patients scheduled to undergo a tightening facial treatment. Intense ultrasound treatments were performed as a series of several linear exposures delivered 1.5 to 2.0 mm apart with the use of 1 of 3 available handpieces with different focal depths. Subject pain ratings and standardized digital photographs were obtained at uniform points.
Results: One hundred and twenty subjects were enrolled. Most patient exposures were associated with transient superficial skin erythema and slight to mild discomfort on a standardized pain scale. No other adverse effects were noted. Epidermis was spared in all cases. Primary outcome measure was detection of improvement in paired comparison of pretreatment and posttreatment (day 90) photographs.
Conclusion: In this clinical study of intense ultrasound therapy to facial tissues the treatment appears to be a safe and effective modality for facial skin tightening.

CLINICAL STUDY WITH A PICOSECOND ALEXANDRITE LASER AND A DIFFRACTIVE OPTIC FOR PHOTO-REJUVENATION AND PIGMENT REDUCTION IN SKIN TYPES II–IV DURING THE SUMMER MONTHS IN A SUN RICH ENVIRONMENT

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Background: Photo rejuvenation with pigment reduction has been a popular procedure using devices. Patients and providers

have wanted a device that can safely treat darker skin patients and they have wanted to able treat during the summer months. In this study we evaluated patients (skin type II to IV) treated for unwanted pigmentation as well as skin tone and texture during the summer months in California. All patients were treated with a diffractive lens array optic on the picosecond 755 nm alexandrite laser. This optic creates an area of laser induced optical breakdown in the epidermis which is responsible for epidermal and dermal remodeling and pigment reduction.

Study Design/Materials and Method: 18 patients were treated prospectively with the picosecond 755 nm alexandrite system employing a diffractive optic. Lighter skinned patients were treated with the 6 mm optic at 0.71 J/cm^2 and darker skinned patients were treated with the 8 mm optic at 0.40 J/cm^2. Patients received topical anesthesia 30 min prior to treatment.

Results: 2 blinded evaluators were able to determine the pre-treatment image as compared to the post treatment image an average of 74% of the time. In grading, an average of 78.5% of the patients had noticeable improvement with 31% of them being much improved to very improved. There were no adverse reactions or unanticipated complications.

Conclusion: The picosecond 755 nm alexandrite with this fractional optic is safe and effective photo rejuvenation and pigment reduction in light and dark skin types during the summer months in a sunny climate.

COMPARISON OF A NOVEL WOUND DRESSING VERSUS CURRENT CLINICAL PRACTICE AFTER LASER RESURFACING

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Background: A variety of wound dressings have been used for post-ablative laser resurfacing. Historically, silicone-based gels have only been used for fully healed wounds. This study evaluated the comparative healing response after full field erbium laser resurfacing to either the commonly used petroleum jelly ointment versus a novel new-silicone based gel that is intended to be used on open wounds.

Study Design/Materials and Method: A randomized, open label, split-face study was performed. Twenty subjects (Skin types I–III) underwent Er:YAG laser resurfacing at fluences ranging from 12.5 J–50 J/cm^2—depending on the anatomic facial area that was to be treated. Following the procedure either petroleum jelly (Aquaphor, Beiersdorf) or a silicone-based gel (Stratpharma, Basel Switzerland) were applied to the right or left sides of the face. Subjects applied the products twice a day and were evaluated at 60 days. Using 3D Skin Analysis, pictures were taken pre-procedure, immediately post-procedure, and at day 7, 30, and 60. Blinded evaluation of photographs were performed. In addition subjects reported on the overall general aesthetic outcome, perceived pain, itch, and tightness *via* questionnaires.

Results: All subjects healed without complications. By 60 days, there was no difference in healing between the 2 different dressing approaches. However, patients treated with the silicone gel had less post-treatment erythema and post-inflammatory hyperpigmentation. All subjects preferred the simplicity of a topically applied silicone gel as compared to petroleum jelly.

Conclusion: A novel new silicone-based gel represents an exciting alternative approach to post laser resurfacing wound dressings.

DERMATOLOGICAL DEVICE REGULATION WITHIN THE FOOD AND DRUG ADMINISTRATION'S 510(K) PATHWAY

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Background: Device development in the field of dermatology is increasing. Applications for new devices identified as "substantially equivalent" to predicate devices by the U.S. Food and Drug Administration (FDA) may be exempt from Premarket Approval. These devices undergo clearance *via* the 510(k) process with less clinical data requirements. The objective of this study is to investigate characteristics of dermatological devices approved by the 510(k) process.

Study Design/Materials and Method: A retrospective review of the publicly available FDA 510(k) and device recall databases was performed with records from January 1st, 1993 to December 31st, 2016. Records were included if devices were intended for cutaneous use or application within the dermatology outpatient setting. Devices were categorized into laser/thermal, light-based, non-thermal surgical, wound, ultrasound, or cooling/cryogenic per database nomenclature. Data was collected on device characteristics, approval pathways, FDA decisions, recalls, and geographic location of device applicant. Statistical analyses were performed using uni-variate tests and linear regression with $p < 0.05$ considered significant.

Results: 1,986 records were identified from 551 unique applicants. The laser/thermal category was the largest group, representing 77.0% (1,530/1,986) of total dermatological devices approved by the 510(k) process. Application decisions for light-based and wound devices increased significantly during the study period, while laser/thermal slightly decreased, $p < 0.01$. Total recalls amounted to 9.3% (185/1,986) with the majority being class 2. All class 1 ($n = 2$) recalls originated from the laser/thermal group. Applicants were most commonly located in California and Massachusetts.

Conclusion: Few serious adverse events were identified from dermatological devices approved *via* the 510(k) process. Clinicians should be aware of criteria for FDA device approval and associated patient safety data.

DOPPLER IMAGING OF URINARY INCONTINENCE

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Background: Stress urinary incontinence (SUI) is a common clinical problem that may be caused by urthritis or non-inflammatory urethral pathologies. Doppler histogram imaging documents and quantifies inflammatory neovascularity non-invasively.

Study Design/Materials and Method: 21 patients with chronic symptoms over a 2 year period were scanned with 3D Volumetric Doppler Ultrasound for SUI. External probe covers allowed non-invasive imaging of the bladder and urethra.

Results: 2 patients has urethral diverticula. 5 patients had periurethral hyperemia resolving after therapy. 9 patients had pelvic organ prolapse. 5 patients demonstrated no pathology on imaging. no bladder calculi were noted.

Conclusion: Doppler ultrasound may identify periurethral inflammation and monitor treatment results.

EARLY LASER INTERVENTION TO REDUCE SCAR FORMATION: A SYSTEMATIC REVIEW OF CLINICAL TRIALS

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Background: The ability of laser treatment to affect wound healing and subsequently minimize scar formation has been investigated in recent years, but no systematic review links these clinical trials. The aim of this study is to systematically review and evaluate clinical evidence for early laser intervention introduced in inflammation, proliferation or remodeling phases of wound healing with first treatment performed <3 months after wounding.

Study Design/Materials and Method: We searched PubMed using relevant key words in June 2017. Titles, abstracts and articles were sorted according to inclusion and exclusion criteria. Methodological quality was evaluated according to Cochrane Collaborations risk-of-bias assessment guideline by two independent authors.

Results: Twenty-five articles met the inclusion criteria. The following laser devices have been investigated; pulsed dye (PDL) laser, potassium-titanyl-phosphate (KTP) laser, fractional Er:Glass 1540 nm/1550 nm, fractional/full-ablation erbium-doped-yttrium-aluminum-garnet (Er:YAG) laser, or fractional CO_2 laser. Eighteen studies applied laser treatments 2–4 times with 2–8 weeks intervals, while 7 studies applied only one laser treatment. Follow-up time ranged from 1–12 months with 18 studies using a follow-up time ≤3 months. In general, laser treated wounds and scars showed benefit from laser intervention, though not always reaching significance. Significant scar improvement were found in: 3 of 4 studies using laser treatment in inflammation phase, in 6 of 16 studies with laser initiated in the proliferation phase and in 2 of 5 studies in the remodeling phase. Methodological quality included high risk-of- bias in terms of randomization and allocation concealment, but low risk-of-bias with regard to blinding of outcome assessment and lost to follow-up.

Conclusion: Laser intervention, when introduced in inflammation, proliferation or remodeling phase has the potential to reduce cutaneous scar formation. Further high quality studies are needed before standard protocols can be implemented in clinical practice.

EFFECT OF LOW-LEVEL LASER THERAPY ON MASSETER AND ANTERIOR TEMPORAL MUSCLES PRIOR TO INDUCTION OF FATIGUE: A RANDOMIZED, SHAM-CONTROLLED, BLIND, CLINICAL TRIAL

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Background: The aim of the present study was to evaluate the effect of low-level laser therapy on bite force, mandibular range of motion, sensitivity to palpation and fatigue in the masseter and anterior temporal muscles of young patients when administered prior to the induction of fatigue.

Study Design/Materials and Method: Fifty-two healthy volunteers aged 18 to 23 years were randomly allocated to a laser group and sham group. Both groups were submitted to a clinical evaluation to record mandibular range of motion, bite force, muscle sensitivity to palpation and muscle fatigue. The laser group was then submitted to low-level laser therapy (780 nm, 25 J/cm^2, 50 mW, 20 seconds per point) on three points of the masseter and one point of the anterior temporal muscle on each side. The sham group was submitted to the same procedure, but with the device switched off. The volunteers were then instructed to chew two pieces of gum (one on each side) for six minutes, with the pace set by a metronome calibrated to 80 bpm, followed by the reevaluation of all variables. The results were submitted to analysis of variance and then to Tukey's multiple comparisons method. For intra-group comparison the Wilcoxon and Mann–Whitney test were applied.

Results: No statistically significant inter-group or intra-group differences were found for the variables analyzed.

Conclusion: With the proposed protocol, low-level laser therapy administered prior to the induction of fatigue did not lead to any changes in bite force and mandibular range of motion, indicating that further studies are needed with different low-level laser dosimetric parameters.

EFFECTIVENESS OF PHOTOBIOMODULATION IN SLEEP BRUXISM CHILDREN WITH HEADACHE ASSOCIATED BY STRESS

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Background: Sleep bruxism (SB) is mandibular movements, as clenching and grinding teeth during the night. Headache may be another additional sign, which appears during the day, after an intense muscle effort during the night. Stress has been investigated in SB cases. Salivary cortisol levels have been measured to verify physiologically potential stress situations. SB treatments in children are controversial yet. Gold standard, occlusal splints therapy, needs a great patient cooperation, however it is not enough in some cases. Photobiomodulation has been used in other muscles treatment, could be an alternative for this case, especially for good properties as analgesia for biostimulation, increased local blood by vasodilation, anti-inflammatory effects. Thus, this study aimed to investigate the use of laser therapy in SB treatment in children with headache associated by stress.

Study Design/Materials and Method: SB was diagnosed according to ICDS-4 guideline: guardian's report and presence of wear facets in permanent teeth. Total sample was composed by 76 children, 6–12 years old, divided in 4 groups: G1- With SB, Laser therapy treated in acupuncture points ($\lambda = 94$ nm, 5 J/cm^2, 1.675 mW/cm^2, 0.070W, 20 s/point); G2–With SB, Occlusal Splint treated, G3–With SB, Placebo treated; and G4–Without SB, Control group. The presence or absence of headache was reported by guardians in anamnesis. The saliva was collected during the morning, freeze and processed by ELISA (Salimetrics, State College, PA). Statistical analysis was performed with the aid of the SPSS 20.0 program with a 5% significance level ($p \leq 0.05$), using Kolmogorov–Smirnov, Shapiro–Wilk and ANOVA tests.

Results: When observed intra-groups, there was a statistically significant difference between the frequency of children with headache before and after treatment in the G1 ($p = 0.005$) and G2 ($p = 0.0001$). However, in an inter-groups analysis, there was no difference between these two groups (G1 and G2). In salivary cortisol levels analysis between groups after treatment, G3 had statistically significant higher levels from the others.
Conclusion: Thus, results showed Laser therapy group (G1) performing as well as occlusal splints therapy (G2), considered gold standard treatment currently, confirming the accuracy of laser effects in muscle tissues. The increase of a salivary cortisol levels in placebo (G3) may suggest a propensity to anxiety for the technique applied by the patient, and the necessity to demystify the use and benefits of these therapy.

EFFICACY OF HIGH INTENSITY FOCUSED ELECTRO-MAGNETIC (HIFEM) FIELD THERAPY WHEN USED FOR NON-INVASIVE BUTTOCKS AUGMENTATION AND LIFTING: A CLINICAL STUDY

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Background: Despite practitioners facing increasing demand for aesthetic improvement of buttocks, there is currently no non-surgical alternative to buttock augmentation based on fat grafting or silicone implants. The investigated device utilizes non-invasive magnetic technology that induces supramaximal deep muscle contractions, which cause gluteus muscles growth and remodeling. The goal was to identify the effects of the therapy and satisfaction of patients when applied to buttocks, and to determine if this may be a completely new approach to non-invasive buttock improvement.
Study Design/Materials and Method: 21 women (32.9 average age) were treated with a High Intensity Focused Electro-Magnetic (HIFEM) field device. The protocol encompassed 4 sessions (30 minutes each) within two weeks. Supramaximal contractions of gluteus maximus, minimus and medius were induced during the treatments. Subjects were evaluated at baseline, after the last treatment, and at 1-month follow-up; evaluation included weight measurement, patient photographs, and level of treatment comfort and satisfaction with results using a visual analogue scale (VAS) questionnaire.
Results: Weight change was insignificant. After the last session and 1 month post treatments, respectively, patients consistently reported high levels of satisfaction with treatment results (average score 7.2 ± 1.77 and 7.4 ± 1.73) and found the treatments very comfortable (8.3 ± 1.9 after last session) on a 0–10 VAS. None of the subjects reported discomfort or dissatisfaction with results (score <5). Digital photographs showed aesthetic improvement in most patients through improved shape and volume of the treated area, overall buttocks lifting and reduction in muscle laxity).
Conclusion: The treatments caused significant changes to gluteus muscles which translated into overall aesthetic improvement of the treated area. Patients reported high levels of satisfaction while primarily appreciating the lifting effect of the treatments. All subjects responded to the treatment. We suggest the device can be used as a unique non-invasive way to augment and improve the buttock area in patients, as an alternative to surgical procedures.

EVALUATION OF THE EFFECT OF PHOTOBIOMODULATION COMBINED WITH FIG EXTRACT TO MINIMIZE THE UVA RADIATION DAMAGE TO KERATINOCYTES

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Background: In Brazil and worldwide there is a trend in the use of plant extracts in cosmetic products of all kinds. These extracts present antioxidant activity, mainly due to the presence of polyphenols. For this reason, these compounds are used to stimulate cell renewal or inhibit deleterious processes induced by ultraviolet radiation (UV) in the skin. On the other hand, photobiomodulation has been shown to be an efficient tool to induce cell renewal. The combination of antioxidant therapy with extracts and photobiomodulation seems to be an interesting possibility to reduce the harmful effects of UV radiation. The objective of this work is to evaluate the therapeutic effect of fig extract in human keratinocytes in culture combined with red LED, to minimize the effects of UV-A radiation.
Study Design/Materials and Method: Human normal keratinocytes (HaCaT–CLS CM1) were seeded in 48 well plates (60,000 cells/well). The cells were exposed to UV-A (366 ± 10 nm, 2.5 mW/cm^2, 90 minutes), then treated with fig extract (0.3% in 1% FBS DMEM, for 24 hours). At the end of this treatment, cells were washed and received photobiomodulation (640nm $\pm$ 12.5 nm, 2.6 mW/cm^2, 7 minutes). Untreated controls were also performed. At the end of the treatments, cells were washed with PBS and 10% FBS DMEM was added, keeping the cells in the incubator for 48 hours. Finally, the MTT colorimetric assay was performed.
Results: It was observed that 13.5 J/cm^2 of UV-A causes damage in keratinocytes, reducing the amount of living cells to 80%. However, the use of photobiomodulation (2.6 mW/cm^2) after UV-A damage promoted recovery (to approx. 92%), but did not reach the baseline levels. The application of LED without previous damages has no effect on the keratinocytes, as well as the application of fig extract. On the other hand, treatment of keratinocytes with fig extract after UV-A damage caused a 28% reduction in cell amount. Also in this case, the photobiomodulation promoted recovery (to approx. 85%) without reaching basal levels.
Conclusion: After oxidative damage caused by UV-A radiation, keratinocytes were sensitive to fig extract, which presented toxicity. On the other hand, photobiomodulation could recover cells after UV-A damage, as well as after the exposure to fig extract. Further studies are necessary to understand clearly this effect, since MTT evaluates living cells in terms of mitochondrial activity and the observed effect can be related to increase in mitochondrial activity.

EVALUATION OF THE SAFETY AND EFFICACY OF THE PICOSECOND ALEXANDRITE LASER WITH SPECIALIZED FOCUS LENS ARRAY FOR TREATMENT OF THE MELASMA IN ASIAN PATIENTS

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Background: Melasma is caused by not only over production of melanin but hyperactivity of melanocytes. The objective of this study was to evaluate the efficacy and safety of picosecond 755 nm alexandrite laser plus focus lens array which can cause laser induced optical breakdown (LIOB) for melasma treatment.
Study Design/Materials and Method: Twenty melasma patients were recruited. All of them undergone two sessions of picosecond 755 nm alexandrite laser (Cynosure, MA) with 4–6 weeks interval. The parameters were 8 mm spot size, 750 ps pulse duration, 2-treatment passes, connected with focus lens array which carried the energy fluence of 0.4 J/cm^2. Melasma Area and Severity Index (MASI) and multi-lighting analyzed imaging system (Canfield Scientific, Inc., NJ) were used to assess and evaluate at the 4-week visit after completion of the second session. Clinical improvement and side effects were assessed by physician and patient.
Results: All 20 patients finished 2-session treatment were female with Fitzpatrick skin type IV. The average age was 43.75 (SD = 8.15) years old. Nine (45%) patients scored 50%–75% improvement, while 5 (25%) scored 25%–50% improvement. In physician's evaluation, 8 (40%) patients showed 50%–75% improvement, and 8 (40%) patients showed 25%–50% improvement. The mean MASI score showed significant improvement from 9.0 ± 4.8 to 6.5 ± 3.7 ($p < 0.001$). The MASI score at baseline had high correlation with MASI improvement ($r = 0.73$, $p < 0.001$). VISIA analysis of frontal face presented improvement in spots, wrinkles, texture, pores, UV spots, brown spots and porphyrins, although only significant for spots ($p = 0.007$) and porphyria ($p = 0.032$). Some patients experienced erythema (25%), pruritus (20%) and scaling (20%), which subsided after few days of usage of emollients and sunscreen. Only one patient (5%) had mild PIH, which regressed by three weeks.
Conclusion: Picosecond 755 nm alexandrite laser with focus lens array objectively demonstrated great efficacy for melasma treatment in just two sessions without obvious side effects.

EXOGENOUS ANDROGEN INDUCED TELANGIECTASIAS TREATED WITH IPL AND PULSED DYE LASER

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Background: A 48-year-old male with a history of intramuscular testosterone administration (depo-testosterone cypionate) for idiopathic hypogonadism presented with a three year history of worsening redness over the chest, shoulders, neck and back. He complained of flushing and warmth of his upper trunk and face while on depo-testosterone cypionate. A biopsy of the trunk showed telangiectasias. Extensive workup and clinical history revealed no underlying etiology for his telangiectasias. Cessation of Depo-testosterone and transition to topical testosterone (Abbvie) coincided with stabilization of the telangiectasias. He was diligent about sun protection and had no other risk factors for these findings. His testosterone level was 309 ng/dL (240–950) at presentation to dermatology.
Study Design/Materials and Method: The patient was treated with intense pulsed light (Lumenis) using the 515 nm filter, 18 J/cm^2, double pulse of 3.5 ms with a 15 msec rest. After his first IPL treatment, he had one pulsed dye laser (Candela) treatment using a 10 mm spot size, 10 ms pulse duration and fluency of 6 J/cm^2.
Results: Over 15 months, the patient had 5 IPL treatments and one pulsed dye laser treatment with a satisfactory response. His testosterone level remained within the reference range on topical testosterone and he did not subjectively appreciate any worsening of his condition.
Conclusion: Depo-testosterone cypionate is a common treatment for hypogonadism in males. Men presenting with new onset or worsening telangiectasias should be queried about their use of exogenous testosterone. Exogenous-androgen induced telangiectasias can be successfully treated with IPL and PDL.

EXPERIMENTAL MODEL OF TRAM FLAP IN RATS TO STUDY PHOTOBIOMODULATION

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Background: Myocutaneous flaps are widely used in order to facilitate the reconstruction of an injured area. This type of flap keeps their own vascularization and fill the wound. The TRAM flap is a very known flap used in breast reconstruction. Skin necrosis is a possible complication. The experimental model of TRAM flaps in rats has been used by our research group to study pharmacological and not pharmacological agents to prevent skin necrosis. The present study intends to present the experimental TRAM Flap in rats as a standardized model to study different photobiomodulation protocols.
Study Design/Materials and Method: The TRAM flap is marked in Rats Rattus norvegicus Albinus Wistar, 250–280 g. The surgery can include the use of micro clamps to study ischemia and reperfusion, if applicable. The clinical diagnosis of skin necrosis occurs at the 7th day post op. Photobiomodulation can be tested with different parameters, sessions, can be applied pre-op, intra-op and or post-op to simulate the clinical uses. The results are evaluated by calculating and comparing the area of necrosis the animals presented at seven days post op. Blood and tissue samples can be obtained.
Results: This study presents the design and results of three previous projects to demonstrate the importance of this model to study photobiomodulation effects. The first study: LOW LEVEL LASER THERAPY ON TRAM FLAPS IN RATS SUBMITTED TO NICOTINE APPLICATION. The second: PHOTOBIOMODULATION EFFECT ON MYOCUTANEOUS FLAPS: DIFFERENT DOSE EVALUATION IN NICOTINE RATS. The third: PHOTOBIOMODULATION IN EXPERIMENTAL MODEL OF ISCHEMIA AND REPERFUSION IN TRAM FLAP IN RATS
Conclusion: The TRAM Flap is a standardized experimental model in rats that can be used to compare different protocols of photobiomodulation.

HIGH INTENSITY Nd:YAG LASER TREATMENT FOR CHRONIC WOUNDS HEALING

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Background: Chronic wounds that are difficult to heal represent a serious problem, the lesions severely affect the quality of life of individuals, decrease the mobility and cause the loss of productivity. In this paper we are reporting about results of high intensity pulsed Nd:YAG laser treatment of chronic wounds and are giving the assessment of efficacy and safety of this laser therapy.
Study Design/Materials and Method: This is a case series study performed in a single medical center: Skin Rachel Clinic, Bandar Lampung, Indonesia. Patients having chronic wounds

which were not healing for longer than a year were treated with Nd:YAG 1064 nm laser. Treatment protocol consisted of two phases, in the first 20 ms long pulses were used while in the second we used shorter, 1.6 ms pulses. In both phases 4 mm spot, 35 J/cm^2 and 6 Hz were used. The wounds were manually scanned with laser beam in horizontal and vertical directions with two full passes. Patients received one to four sessions with one week intervals. At each visit the size of the wound and reduction of the pain were assessed

Results: 8 patients having various chronic wounds and one patient with acute necrotic wound were treated in period from January to August 2017. Four patients had chronic leg ulcers, three had anal fistulas, one chronic dermatitis and one palmar post injury necrosis. In all patients the wound healing was accelerated already after the first session and in all but one wound closure was achieved after two sessions. All patients tolerated the treatment well and no one was reporting any adverse effects.

Conclusion: High intensity long pulse Nd:YAG laser had shown good results in chronic wounds healing and seems to be a promising alternative to existing therapies. Larger series and longer follow ups are needed to allow us to draw the firm conclusions.

HIGH SENSITIVITY SPATIAL AND TEMPORAL QUANTIFICATION OF SKIN GLOSS EFFECT OF COSMETIC COMPOSITIONS

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Background: We demonstrate a low-cost, non-contact optical method with improved sensitivity for assessing skin attributes such as skin gloss. The presently used methods for skin gloss measurements are based on the ratio of specular to diffuse intensity. This method is more sensitive for measurements of high-gloss surfaces such as ceramics, than low-gloss surfaces like skin. Apart from that, skin gloss measurements require high sensitivity to detect small incremental gloss values changes that occur in the low gloss regime. The proposed methods open new possibilities in the fields of cosmetology and dermatopharmacology for measuring absorption kinetics and the pharmacodynamics of various external agents applied on the skin.

Study Design/Materials and Method: We developed an optical prototype comprising a low-cost camera and ring illumination. The skin is illuminated with multiple unpolarized white light sources (Lumileds LXZ1-4070) at an angle of incidence of approximately 22°. Gloss value is calculated from the camera image based on the slope of the intensity gradient in the transition between specular and diffuse reflection and on the sum over the intensities of pixels above threshold [1]. Using the prototype, we measured the absorption kinetics of common cream bases: unguentum emulsificans aquosum, uecrin cum aqua, vaseline white, paraffinum perliquidum. The creams (0.5 g per 65.5 cm^2) were applied on the forearm of a clinically healthy female volunteer (26 years). The measurements were taken immediately after application, 1 min, 10 min, 20 min and 30 min after application of the creams. The experimental results obtained with the prototype were compared with professional skin gloss measurement devices such as SAMBA (Bossa Nova) and skin gloss meter (Courage & Khazaka).

Results: The measurements showed different absorption kinetics for different creams. The fastest changes were detected for unguentum emulsificans aquosum, than paraffin perliquidun, than eucerin cum aqua, than vaseline. Detected kinetics was in line with the anticipated nature of interaction of applied creams with skin. The performance and linearity of the method compared with different conventional professional gloss measurement devices showed improved sensitivity for quantifying the temporal evolution of skin gloss as an indicator of absorption kinetics.

Conclusion: We report low-cost highly sensitive non-contact optical method for quantitative assessment of the skin gloss in the low gloss regime. The proposed method has potential applications in the fields of fundamental as well as applied research in cosmetology and dermatopharmacology for measuring absorption kinetics and also for testing the acceptance of various cosmetic and pharmaceutical products that are used for influencing the skin gloss conditions.

LASER MODALITIES FOR THE TREATMENT OF ARGYRIA: REVIEW OF THE LITERATURE

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Background: Argyria, or argyrois, is an acquired condition characterized by systemic or localized skin discoloration to purple and grey due to excessive exposure to the element silver. Treatment options for argyria are poorly documented and have not been standardized.

Study Design/Materials and Method: The present review seeks to discuss the utilization of the picosecond 755 nm Q-switched alexandrite laser and Q-switched 1064 nm Nd:YAG laser in the treatment of argyria. Systemic review of the literature demonstrated 12 patients with argyria that underwent novel laser treatment.

Results: The results demonstrated that both the picosecond 755 nm Q-switched alexandrite laser and Q-switched 1064 nm Nd:YAG laser were both 100% effective in immediate clearance of the dyspigmentation caused by elemental silver. Both laser techniques had sustained clearance up to one-year post-treatment. Transient negative side effects were present in all cases and included pain during the procedure as well as post-procedural erythema, edema, and scaling without crusting or blistering.

Conclusion: Laser therapy is a novel and successful treatment modality in the treatment of this rare but disfiguring disorder. Given the rarity of this disorder, this review of available case studies serves to comprehensively describe clinical presentation and novel laser treatment approaches to argyria.

MOLLUSCUM CONTAGIOSUM INFECTION FOLLOWING 1927 nm NON-ABLATIVE FRACTIONAL LASER TREATMENT

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Background: The potential for infectious complications after laser procedures is well known, especially with fully ablative lasers. Currently, herpes simplex virus (HSV) reactivation remains one of the more notorious infectious events, for which prophylaxis is commonly given. This case describes infection with molluscum contagiosum (MC) following non-ablative fractional laser treatment.

Study Design/Materials and Method: A 45-year-old Caucasian female presented for photorejuvenation of her upper back and arms. Two 1927 nm non-ablative fractional laser

treatments were performed to her upper back, spaced 8 weeks apart. Over a similar period, she underwent three treatments to her bilateral arms, spaced 4–6 weeks apart. The laser settings were as follows: energy of 10 mJ, treatment level 4, and 4–6 passes. A slightly pruritic, papular rash appeared on the patient's arms 7 to 10 days following the last arm treatment. The pink papules and pseudovesicles spread to the patient's back, most without apparent central umbilication.
Results: The differential diagnosis included folliculitis, candidiasis, and polymorphous light eruption, among others. A punch biopsy was performed and confirmed the diagnosis of MC. The lesions resolved with cryotherapy and topical imiquimod. The patient did later admit to brief exposure to children infected with MC. MC is a poxvirus, and infections can be exacerbated by disruptions in the epidermal barrier function, such as in children with atopic eczema. Non-ablative fractional lasers cause focal areas of epidermal and dermal injury. Theoretically, this leads to a breakdown of the protective epidermal barrier, allowing for enhanced local spread of the poxvirus. The timing and distribution of the patient's lesions supports the contributing role of the laser in this infection.
Conclusion: Practitioners must be aware of all potential infectious post-laser complications, usually resulting from an impaired epidermal barrier. Viral culprits can go beyond the commonly discussed HSV to include MC, especially when there is known exposure.

NEW ENERGY DEVICES FOR NECK REJUVENATION: A LITERATURE REVIEW ON MODALITIES AND EFFICACY

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Background: During the aging process, the neck develops skin dyspigmentation, rhytides, loss of mandibular contour, accumulation of submental fat, and prominence of platysmal bands. Assorted energy producing modalities are used to target distinct factors of the aging process
Study Design/Materials and Method: Novel publications from 2014–2016 regarding neck rejuvenation technologies were reviewed. This revealed a surge of new technologies including lasers, radiofrequency devices, photodynamic therapy, and combination therapies.
Results: One prospective study of non-ablative fractionated laser resurfacing in 18 women found immediate improvement in skin dyschromia, laxity, and wrinkles; re-evaluation at 3-months only showed sustained improvement in dyschromia and wrinkles. Another study evaluated long-term efficacy of fractional CO_2 laser utilizing independent blinded reviewers. Participants had significant improvement in skin laxity, jowls, fat deposition, and horizontal neck lines both one-month and one-year post-treatment. No persistent complication was identified at one-year follow-up making this a safe option with proven long-term efficacy. In regards to photodynamic treatment of the neck, a comparison study evaluated intense pulse light (IPL) and red light energy with and without photodynamic therapy (PDT) using 5-ALA. The neck was divided into four equal sections and treated with a different single or combination therapy. The IPL-PDT and red light-PDT groups had better efficacy than IPL or red light alone.
Conclusion: With regards to photodamage and dyschromia, it is the author's opinion that non-ablative fractionated lasers proved efficacious clinically compared to photodynamic therapies. In regards to skin laxity and submental fullness, the studies support superior outcome for CO_2 lasers but with more downtime and need for expert clinicians. Using lasers in combination with secondary treatment modalities have the best cosmetic outcomes. This is an exciting new era for neck rejuvenation. As physicians continue to mix and match treatment modalities to meet each patients' individual needs, more research on combination therapies can be expected.

NON-SURGICAL FAT REDUCTION: A SOCIAL MEDIA ANALYSIS

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Background: Social media has become a mainstream method of allowing patients to report and rate their satisfaction with cosmetic procedures and providers. These outlets may provide a more transparent view of patient satisfaction and with the recent growth of non-surgical fat reduction treatments, we sought to perform a social media analysis.
Study Design/Materials and Method: Data was collected from 2006–2017 examining trends in satisfaction of all non-surgical fat reduction treatments from the RealSelf website. Additionally, google trends data was analyzed over this period, comparing the relative interest between non-surgical fat reduction search terms.
Results: Consumers visited RealSelf over 7 million times in the past year to research non-surgical fat reduction, a 1% decrease compared to the prior year. Consumers spend the most time viewing Photo 56% (38% user photos, 18% provider photos), followed by reviews 25%, questions 16%, discussions 1% and guides 1%. The overall satisfaction rating of all non-surgical fat reduction treatments was 78%. Based on all ratings since 2006, CoolSculpting was the most popular treatment with 2056 ratings and an overall satisfaction of 77%, followed by Kybella (235 ratings, 79% satisfaction), SculpSure (230 ratings, 69% satisfaction), Vanquish (165 ratings, 71% satisfaction), and Ultrashape/Ultrashape power (139 ratings, 85.5% satisfaction). The overall surgical fat reduction satisfaction rating was 88%. Top questions asked by consumers related to cost, long-term results, efficacy, and modality comparisons. Google trends data revealed CoolSulpting as the most popular trending non-surgical fat reduction search term which peaked popularity in January 2016. As of October 2017, relative google trend interests were; 49/100 CoolSculpting, 16/100 Kybella, 6/100 SculpSure, 1/100 Ultrashape.
Conclusion: Social media can provide transparent insight into how procedures are evaluated and perceived. Non-surgical fat reduction has lower overall satisfaction compared to surgical fat reduction. Before and after photography continues to play a critical role in informing aesthetic consumers.

OPTIMIZATION OF Er:FIBER LASER FOR NON-ABLATIVE FRACTIONAL TREATMENT OF SKIN AND ORAL TISSUES

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Background: Non-ablative fractional laser treatment of skin has met with considerable success when used for various indications in dermatology. At the same time, effects of fractional treatment on oral soft tissues are much less studied. Evolution of dermatological fractional systems and expansion of the application ability of fractional technologies in other fields such as dentistry requires good understanding of interaction between soft tissues and laser light in fractional regime.

Study Design/Materials and Method: In this work, we used Er:fiber laser with wavelength of 1550 nm, peak power of 25 W, operated in pulsed mode. *Ex vivo* experiments were conducted on porcine skin and porcine soft oral tissues. Effects of laser beam diameter variation from 25 to 400 um (through scanning beam waist along z-axis) and pulse energy in the range from 10 to 150 mJ on coagulative columns' shape were investigated in detail. NBTC staining was used to assess depth and diameter of the columns. Laser parameters for human clinical study were determined based on the results of *ex vivo* experiments. Clinically, biopsies of keratinized gum and alveolar mucosa were collected for subsequent histological analysis using H&E staining. The results were compared with *ex vivo* data.

Results: Ex vivo data revealed that under optimal conditions columns up to 800 μm in depth could be reliably produced in the keratinized gum and alveolar mucosa with 130 mJ pulses, and in the skin with 70 mJ pulses. Non-monotonic dependence of the column's depth on position of the beam waist (and, hence, beam diameter) has been found for both types of tissues *ex vivo*. Generally, good agreement between *ex vivo* and *in vivo* datasets was observed.

Conclusion: Ex vivo data offer reliable and valuable information for optimal design of tissue-specific Er:fiber laser-based fractional devices.

PARADOXICAL INCREASE IN TELANGIECTASIA FOLLOWING PULSED DYE LASER TREATMENT OF RADIATION-INDUCED TELANGIECTASIA

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Background: Radiation-induced telangiectasia are a common sequela to radiation therapy. Several studies have demonstrated the efficacy of 585 nm and 595 nm pulsed dye laser (PDL) in the treatment of radiation induced telangiectasia. Though paradoxical hypertrichosis following laser epilation has been reported, paradoxical increase in telangiectasia following PDL has not been described. We report a case of paradoxical increase in telangiectasia following treatment with 585 nm PDL.

Study Design/Materials and Method: A 34-year-old female with history of subglottic adenosquamous carcinoma status post radiation treatment with 7000 Gy in 35 fractions presented 25 months following her final radiation treatment. Telangiectasia were noted on the anterior neck. A 585 nm PDL (Syneron Candela), 7 mm spot size, 10 ms pulse duration, and fluence of 13 J/cm^2 was used for treatment of her telangiectasia. A total of 39 pulses were delivered with 30/20 cryogen cooling. The patient tolerated the procedure well with expected post-treatment purpura, no burns noted.

Results: Telangiectasia initially regressed, but within 2 weeks new telangiectasia were noted both inside and outside the treatment field. Twelve months following initial PDL treatment the patient was treated with 585 nm PDL with 7 mm spot size, 10 ms pulse width, and fluence of 11.5 J/cm^2. A total of 140 pulses were delivered with cryogen set at 30/20. Again, the patient tolerated the procedure well with expected post-treatment purpura. At 2 weeks following second treatment a decrease in telangiectasia was achieved.

Conclusion: Laser therapy and subsequent thermal injury has been shown to induce several inflammatory mediators and angiogenic factors. Many authors suggest that paradoxical hypertrichosis may in part be explained by increased vascularization of hair follicles. It is possible that similar mediators may cause a paradoxical increase in telangiectasia following PDL treatment.

PILOT EVALUATION OF A NOVEL 1927 nm LASER SYSTEM, WITH MAGNETIC ROLLER-ASSISTEDTRACKING, FOR THE TREATMENT of FACIAL PHOTOAGING

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Background: Since its introduction more than a decade ago, non-ablative fractional laser wavelengths have become widely popularized for using in facial rejuvenation. In this IRB-approved pilot study evaluated an investigational device, fractional 1927 nm fiber laser (Lutronic, Goyang, S Korea), indicated for non-ablative skin resurfacing and the treatment of pigmented lesions (lentigines), dyschromia; or cutaneous lesions such as, but not limited to: actinic keratosis, melasma, wrinkles; or improving skin tone/skin texture.

Study Design/Materials and Method: 43 subjects with mild to severe photoaging were enrolled at 5 US sites, and received 1–4 treatments. The majority of subjects received 3 treatments (n = 26, 60%). 18 subjects completed ≥1 follow-up visit at 2–3 weeks (n = 3, 6%), 1 month (n = 11 26%), and/or 3 months (n = 4, 9%). Facial treatments encompassed a majority of treatments—face (n = 114, 97%). Other treatment variables: Mean treatment passes = 14.8 ± 2.8, treatment time = 11.4 ± 7.7 minutes, mean pain score = 2.9 ± 2.0

Results: Transient effects post-treatment were noted, included erythema, bronzing, edema, and post-treatment discomfort. No serious adverse events were reported, thus demonstrating device safety. Follow-up assessment demonstrated that 75% of the subjects had a greater than 1 grade improvement, by physician assessment, using a VAS scale (at 1 month post last treatment) in one or more following treatment areas: peri-orbital and peri-oral wrinkles, fine lines, pigmented lesions, skin tone, and enlarged pores.

Conclusion: Results of a series of treatment in this study population showed safety and efficacy in the application of a novel 1927 nm laser system for the treatment of facial photoaging.

RESTROSPECTIVE ANALYSIS OF THE EFFICACY AND SAFETY OF COMBINATION TREATMENT WITH Q-SWITCHED 755 nm ALEXANDRITE AND 1927 nm THULIUM FIBER LASER FOR HYPERPIGMENTATION

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Background: Hyperpigmentation is a common concern among patients and is caused by several factors such as photodamage,

aging, and melasma, and laser therapy can be an effective treatment option. The Q-switched 755 nm alexandrite and 1927 nm thulium fiber laser are frequently used to treat hyperpigmentation, but there have been no reports in the literature of using them as a combination treatment. Our goal is to describe the efficacy and safety of this combination treatment to improve hyperpigmentation both on and off the face.
Study Design/Materials and Method: We performed a retrospective chart review of 39 patients from January 1, 2014 to September 25, 2017 who had one treatment with Q-switched alexandrite laser combined with the 1927 nm thulium fiber laser for hyperpigmentation on the face, neck, chest, and arms (institutional review board approval not required). Blinded assessments of clinical improvement based on a modified grading scale (adapted from Alexiades–Armnenakas) and a global aesthetic improvement scale were performed by two clinicians 2–4 weeks and 1–4 months post treatment.
Results: Preliminary statistical analysis showed an improvement in pigmentation at assessment at both 2–4 weeks (2.22 +/− 0.62 to 1.51 +/− 0.71) and 1–3 months (2.15 +/− 0.75 to 1.24 (+/−1) on a 0 to 4 scale that was statistically significant ($p < 0.05$). Fine lines and skin texture showed statistically significant improvement ($p < 0.001$) at 1–4 months post-treatment on a 0–4 scale as well. Overall global aesthetic was improved to very much improved in 55% of patients at 2–4 weeks and 69% at 1–4 months. No major adverse events were reported.
Conclusion: Combination treatment of Q-switched 755 nm alexandrite and 1927 nm thulium fiber laser for hyperpigmentation on the face and upper body show statistically significant improvement in pigmentation, fine lines, and skin texture. Further analysis of this retrospective study will be presented.

RETROSPECTIVE STUDY OF SAFETY AND EFFICACY OF PICOSECOND ALEXANDRITE 755 nm LASER FOR THE TREATMENT OF MELASMA IN CHINESE

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Background: Melasma is a very common pigmentary skin condition in Asian women. Q-switched Nd:YAG 1064 nm laser with larger spot size and low fluence has been widely used to treat Melasma in Asia. However, it has been reported that some patients didn't respond to the treatment and may result in PIH. Since the introduction of picosecond alexandrite 755 nm laser, promising clinical results for pigmentation removal have been reported. In this study, we aimed to evaluate the efficacy and safety of picosecond alexandrite laser for Melasma in Chinese.
Study Design/Materials and Method: 35 patients diagnosed with Melasma and received picosecond 755 nm laser during January 2016 to December 2016 were included in this study. The patients received laser 3 treatment sessions with one-month interval. All patients' demographics were recorded. Photography were taken at baseline, prior to each treatment session and one month following the last treatment. Images were evaluated independently by two trained dermatologists. Melasma Area and Severity Index (MASI) was used for the evaluation of treatment efficacy: Excellent (>90%), very good (50–89%), Fair (10–49%), poor (<10%). Adverse events and patient satisfaction were monitored until 6-months follow up.
Results: The average age of 35 patients was 39 years-old and all females with Fitzpatrick skin type III to IV. The averaged MASI for baseline and the last follow up are 7.98 ± 5.86 and 4.89 ± 3.93, respectively, which shows statistical improvement ($p < 0.01$). The overall response rate is 80% (excellent: 5%; very good: 29%; fair: 46%), and poor: 20%. Some of the patients experienced a transient PIH after the treatment, all of the PIHs were resolved in 2 weeks to 1 month. The average patient satisfaction rate is 62%. 2 patients with rebound hyperpigmentation 6 months after the treatment, while most of the patients can experience further improvement in their skin condition after 6 months.
Conclusion: The overall response rate of using picosecond alexandrite 755 nm laser for Melasma in Chinese is high, and with low rebound rate. No sever PIH was observed which demonstrated a high safety profile. However, the satisfaction rate should be further improved.

SAFETY AND EFFICACY OF REGIONAL SKIN CRYOTHERAPY TO TREAT AXILLARY HYPERHIDROSIS

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Background: Primary hyperhidrosis (PHY) of the axillae remains difficult to treat if botulinum toxins, anticholinergics or surgery are not applicable. Energy-based treatment modalities comprise lasers, microwaves, radiofrequency or iontophoresis. They are effective but painful. Recently cryotherapy, a well-established concept in medicine, with pain killing qualities has been implemented to treat PHY.
Study Design/Materials and Method: A prospective, single-center, proof of principle study was designed to evaluate safety, efficacy, and tolerability of an integrated cold-hot therapy system in PHY after two treatments within 4 weeks at follow-up 1 and 6 month post interventions. Subjective assessments (HDSS), clinical photographs, pain score (VAS), and minors starch test were chosen for evaluation. Study subjects ($n = 5$) were asked 48 hours prior to treatment to stop shaving of both axilla and not to use of deodorants or antiperspirants. In stationary mode cold and heat was applied following the protocol: cooling down to $-5^{\circ}C$ within 10 min followed by re-heating up to $+30^{\circ}C$ 1 min. The primary endpoint was set to a decrease in sweating defined as a reduction of 1 HDSS level compared to baseline at 1 and 6 month follow-up.
Results: The new integrated cold-hot therapy system was found to be highly tolerable, less painful and showed no down- or healing times in 5 study subjects (3 females, two males). Pain levels were reported as below 1 in all subjects. HDSS at baseline was measured as 3.8, at one month follow-up 1.9 and at 6 month follow-up 1.8. Minors starch test reveal in some axillae a less intense staining at the treatment area.
Conclusion: The new integrated cold-hot therapy system was found to be highly tolerable, less painful and showed no down- or healing times in 5 study subjects (3 females, two males). Pain levels were reported as below 1 in all subjects. HDSS at baseline was measured as 3.8, at one month follow-up 1.9 and at 6 month follow-up 1.8. Minors starch test reveal in some axillae a less in intense staining at the treatment area.

SINGLE-CENTER, RANDOMIZED, SPLIT-FACE TRIAL, COMPARING DOWNTIME POST-HYBRID NON-ABLATIVE AND ABLATIVE FRACTIONAL SKIN RESURFACING OF THE FACE WITH REGENERATIVE SKIN NECTAR

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Background: A proprietary combination of tripeptides and hexapeptides clears the ECM, stimulates collagen and elastin production, and decreases inflammation leading to an accelerated epidermal healing process. A regenerating skin nectar (RSN) containing tripeptides has been shown to decrease healing time following energy-based device procedures. We hypothesize that the antioxidant RSN will shorten downtime following hybrid non-ablative and ablative laser resurfacing to the face.
Study Design/Materials and Method: We performed a split-face, single-blind, randomized study comparing healing time of hybrid non-ablative and ablative laser resurfacing of the face with application of RSN. Five subjects were randomized to apply the RSN to half of the face two weeks pre- and 1 week post-laser procedure. Standardized clinical photography, physician assessment, and subject self-assessments were performed on days 0, 1, 3, 4, and 7.
Results: Based on physician post-treatment assessments, redness was significantly reduced as early as day 1 on the RSN-treated side compared to control, while decreased roughness was seen on day 3 and 4. On day 7, all five subjects had recovered fully from the hybrid laser resurfacing with no appreciable redness, swelling or roughness on either side of the face. All but 1 patient preferred the RSN and felt their complexion looked better on the subject self-assessment.
Conclusion: For patients concerned with downtime, pre and post-procedure treatment with RSN with tripeptides can decrease healing time associated with facial hybrid laser resurfacing, most notably in erythema and roughness.

SONOGRAPHY OF GLAUCOMA

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Background: Early treatment of glaucoma reduces visual loss. Sonography at 15–22 MHz can show disruption of the cribriform plate of the retina which may lead to clinical disease.
Study Design/Materials and Method: 36 patients with glaucoma were scanned with 3D ultrasound over a one year period. The integrity of the cribriform plate was studied in 3 planes by one observer with 35 years of experience with ophthalmic sonograms.
Results: 34/36 patients had interruptions of the plate structural architecture. There was no correlation with disease severity in this study.
Conclusion: 3D sonogram imaging of the retina including the cribriform plate is well tolerated and may allow for early treatment of glaucoma.

SUCCESSFUL TREATMENT OF ACQUIRED NEVI AND SOLAR LENTIGINES WITH 755 nm LONG-PULSED ALEXANDRITE LASER

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Background: Two common melanocytic skin lesions are acquired nevi and solar lentigines, both of which may be cosmetically undesirable for patients. Acquired Nevi are benign lesions that occur on any body site. They may be flat or elevated and vary in color and size. Solar lentigines are light brown macules that arise in sun-exposed areas of patients with lighter skin types. Acquired nevi are often left untreated, with few reports showing efficacy with long-pulsed 755 alexandrite lasers in patients with Asian skin. Solar lentigines are treated with various lasers and pulsed light, but the results are not always satisfactory. We present two patients with acquired nevi and solar lentigines in skin type III–IV treated with long-pulsed 755 alexandrite laser with complete cosmetic resolution and no scarring.
Study Design/Materials and Method: A 63-year-old woman with skin type III and 29-year-old man with skin type IV, both with acquired nevi and solar lentigos were treated with long-pulsed 755 nm alexandrite laser using a 6 mm spot size at 70 J/cm^2, 1.5 ms pulse with dynamic cooling device of 20/10/30 to visibly vaporize each individual nevi or lentigo.
Results: Immediate vaporization was observed of all targeted nevi or lentigos. After one month, complete cosmetic clearance was noted on both patients, without evidence of scarring or hypopigmentation. Healing time may vary from a few weeks to 3 months.
Conclusion: Acquired nevi and solar lentigines can be cosmetically undesirable for patients. With assurance of no suspicious features deeming a necessary biopsy, 755 nm long-pulsed alexandrite laser offers removal without scarring and hyper or hypopigmentation for skin types III and IV. We report two cases of successful cosmetic clearance of solar lentigines and acquired nevi using 755 nm long-pulsed alexandrite laser.

SUCCESSFUL TREATMENT OF MULTIPLE MILIARY OSTEOMA CUTIS USING ERBIUM LASER

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Background: Osteoma Cutis (OC) is a rare condition of bone formation in the skin. OC can occur as a single entity or multiple nodules scattered throughout, also known as multiple military. The formation of the bone metaplasia can be idiopathic or secondary to a condition of chronic inflammation, such as acne, trauma, venous stasis, or genetic disorders such as Albright hereditary dystrophy. Cosmetically concerning, OC papules can be difficult to treat due without risk of scarring or pigmentation, as topical and systemic therapies are ineffective. We report a case of multiple miliary osteomas of the face successfully vaporized and therapeutically treated with Er:YAG laser.
Study Design/Materials and Method: A 64-year-old woman with histologically-proven multiple miliary osteomas of the face were treated with Er:YAG laser using a 0.2 mm spot size at 50 J/cm^2, 10 Hz, 300 microsecond short pulse in a focused and defocused mode to visibly vaporize each individual osteoma.
Results: Immediate vaporization was observed of all osteoma cutis papules, as Er:YAG laser targets the water chromophore present in bone and can vaporize overlying skin with much precision and little thermal conduction. After one month of therapy, the patient healed well by secondary intention. Adverse effects may include textural change and erythema, pending depth of ablation with Er:YAG. Healing time may vary from a few weeks to 3 months.
Conclusion: Osteoma cutis is a rare benign condition that can be cosmetically distressful to patients, with limited surgery options without risk of scarring, pigmentation or complete removal. We report successful therapeutic treatment of osteoma cutis utilizing Er:YAG laser to target the water chromophore in bone.

SUCCESSFUL TREATMENT OF RECALCITRANT HAILEY-HAILEY WITH CO_2 LASER

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Background: Hailey-Hailey disease (HHD) is a rare, autosomal dominant disease, due to loss of function mutation in ATP2C1. This causes abnormal cytoplasmic calcium levels and subsequent acantholysis. It presents with macerated, eroded plaques in the body folds. Given associated malodor, pain, and disfigurement with HHD, patients often experience a significant amount of psychosocial distress secondary to this disease.
Study Design/Materials and Method: A 76-year-old female with HHD for 35 years in the axilla and groin presented for evaluation after failing therapy with topical corticosteroids and acitretin. Diagnosis of HHD was confirmed with histopathology and she was treated with oral glycopyrrolate and magnesium, as well as topical ciclopirox gel and tacrolimus ointment. Patient had minimal improvement and thus CO_2 laser treatment was considered.
Results: Patient was treated with a fractionated carbon dioxide (CO_2) laser (Lumenis) at 150 mJ with 15 watts to the left groin and left axilla, with nearly complete clearance of her disease after 2 treatments.
Conclusion: Hailey–Hailey disease is a rare, painful, malodorous, and disfiguring, acantholytic disease. While topical and oral steroids and retinoids are often considered first line, the addition of CO_2 laser can offer prolonged or permanent remission, with little adverse effects, and high patient satisfaction.

SUCCESSFUL USE OF A FRACTIONAL 2940 nm LASER IN TREATING CHRONIC, SEVERE EROSIVE PUSTULAR DERMATOSIS OF THE SCALP

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Background: Erosive pustular dermatosis of the scalp (EPDS) is a rare inflammatory condition that causes chronic, sterile pustular, crusting lesions which often leave patients with scarring alopecia. Historically, treatments include local and systemic antibiotics and potent steroids which are associated with multiple side effects and prove to be minimally effective. This report details the successful treatment of EPDS using a fractional ablative laser on a patient with long-standing EPDS that was unresponsive to traditional therapies.
Study Design/Materials and Method: A 73-year-old Caucasian female presented with a history of EPDS for eleven years unsuccessfully treated with therapies such as debridement, skin grafts, oral and topical steroids as well as dapsone, azathioprine, methotrexate and mycophenolate mofetil. She underwent 19 treatments with a fractional 2940 nm Er:YAG. Each session included one *pass.* Depth of treatment ranged from 175–250 microns with a density of 11% or 22%. Combination 8% lidocaine and 8% tetracaine cream was used as anesthetic.
Results: Improvements were seen after the first few treatments. At the start of treatment approximately 80% of our patient's scalp and forehead were affected by EPDS. After 19 treatments, only 5% of her scalp remained affected. Fractional ablative laser therapy proved successful in treating severe recalcitrant EPDS.
Conclusion: Fractional Er:YAG may be a promising option for difficult to treat cases of EPDS. Our patient had significant improvement over traditional therapies. Fractionated Er:YAG poses fewer side effects or risks than chronic immunosuppressant medications, and may be an excellent alternative to these therapies in EPDS of any severity. Although more studies are needed, physicians should consider this as a reasonable treatment option for patients with recalcitrant EPDS.

THE APPLICATION OF SUBSURFACE FRACTIONAL ABLATIVE RESURFACING FOR PERIAREOLAR SCAR USING 1064 nm PICOSECOND LASER WITH FRACTIONAL MODE (MLA)

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Background: The main purpose of picosecond laser was more effective treatment of pigmented lesion including tattoo at first. But, In 2014, the FDA approved 755 nm picosecond Alexandrite laser not only for the treatment of pigmented lesions and tattoos but for the treatment of scarring and wrinkles. We studied the use of a 1064 nm picosecond Nd:YAG laser with fractional mode (MLA) in the treatment of Periareolar operative scar.
Study Design/Materials and Method: 15 patients had scar on periareolar area due to breast surgery. When the wounds were completely healed and at least 6 months had passed, the resulting scars each received multiple treatments with a picosecond Nd:YAG laser device (WONTECH, Daejeon, Korea). Treatments were spaced about 1 month apart. Topical anesthetic cream (eutectic mixture of 2.5% lidocaine hydrochloric acid and 2.5% prilocaine; EMLA cream, AstraZeneca AB, Södertälje, Sweden) applied 1 hour before treatment to reduce patient discomfort during the procedure. The laser treatment was performed with a pulse duration of 750 picoseconds and a spot size of 7 mm. To make complete epithelization, a moisturizer and antibiotics ointment were applied for 1 week. Patient satisfaction degrees were compared using Vancouver scar scale(VSS), and adverse events using a Wilcoxon signed-rank test with SPSS version 17.0 (SPSS Inc., Chicago, IL). Differences were considered statistically significant when $p < 0.05$
Results: Mean VSS scores for the treated scars were 7.5 (standard deviation [SD] 1.70) before treatment, 2.7 (SD 0.57) six months after treatment. The mean improvement of VSS score was 4.8, which was evaluated by 2 experienced physicians ($P < 0.05$). The patient's overall satisfaction using a grading scale was also significantly high with their treated scar. Three of the 9 patients (60%) were excellent, 6 (40%) were good with the results. The average of time to reepithelization of epithelial cell was 7 days. After laser treatment, minor complications, such as pain, erythema, scaling have remained for 3 days up to 2 weeks. Any serious adverse effects, such as wound disruption, post inflammatory hyperpigmentation, or dyspigmentation, were not shown in this study.
Conclusion: We got an excellent result from subsurface fractional ablative Resurfacing for periareolar scar using 1064 nm picosecond laser with fractional mode (MLA).

THE EFFICACY OF A DUAL WAVELENGTH PICOSECOND LASER FOR FACIAL TREATMENT OF MELASMA AND SKIN REJUVENATION

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Background: Photoaging in Chinese often presents with benign pigmentary lesions. Q-switched laser for pigmented lesions in Asians reported a 25% post inflammatory hyperpigmentation risk whilst long pulsed Nd:YAG was

reported to have a lower PIH risk. Picosecond lasers of various wavelengths were introduced. The objective of this study is to assess the efficacy of a picosecond laser for the treatment of melasma and skin rejuvenation.
Study Design/Materials and Method: 10 subjects with melasma and 10 subjects with photoaging were recruited. Each subject receives up to 9 facial treatments. Each session they will receive 4 passes of picosecond laser at 1064 nm wavelength with an endpoint of mild erythema. Standardized photographs were taken at baseline, each treatment visit as well as 6 weeks and 12 weeks after the last treatment. These photographs were assessed by two independent physicians. The physician offering treatment rated the MASI score for subjects with melasma and global assessment for subjects for skin rejuvenation. Any adverse effects were recorded. At follow up visits, subjects will assess improvement and satisfaction.
Results: The study is ongoing with 5 subjects being treated for melasma and 7 subjects having skin rejuvenation. Overall, 59 treatment sessions were carried out. For skin rejuvenation, 57% had slight improvement. There was reduction in MASI score but was not statistically significant. No adverse effects were recorded.
Conclusion: The 1064 nm picosecond laser demonstrated some improvement for skin rejuvenation and melasma.

THE INFLUENCE OF PERIODONTAL TREATMENT ASSOCIATED WITH PHOTODYNAMIC THERAPY IN EXPERIMENTAL MODEL OF ASTHMA

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Background: Asthma and periodontal disease (PD) present high relevance economic and social. Evidence suggests that PD can exert systemic immunomodulatory effects. Conventional periodontal treatment (PD) has been associated with photodynamic therapy (PDT). To evaluate the influence of TP associated with PDT on the modulation of pulmonary inflammation in experimental model of asthma.
Study Design/Materials and Method: After approval by the CEP-Uninove (CEUA 020/2015), forty-five Balb/c male mice were divided into 5 groups ($n = 9$): 1. Basal, 2. Asthma (A), 3. A + PD, 4. A + PD + TP, 5. A + PD + TP + PDT. Periodontitis was induced by ligation technique (15 days) and the asthma by administration of ovalbumin (OVA) subcutaneously (days 0 and 7) and nebulization (3 x/week, for 2 weeks). TP was performed with curettes, PDT with methylene blue (0.005%) and irradiated red diode laser = 660 nm, energy density 6,369 J/cm^2, with 9 J per point, delivered in 90s, 2 points. Euthanasia was performed for morphological analysis of the lung and mandible. Cytokines IL-4, IL-5, IL-10, IFN-γ, TNF-α, IL-1β and IL-6 were evaluated. Total and differential counts of inflammatory cells were performed in the Broncho Alveolar Lavage (BAL). To statistical analysis was used one-way ANOVA followed by the Student-Newman–Keuls test.
Results: Group 2 presented an increase in the total number of cells 31,25 (±5,41) in BAL ($p < 0.05$), corresponding to ± 8% of total leukocytes. In group 3, the presence of PD in asthmatic mice decreased 81 (±41) ($p < 0.001$) the release of IL-5 when compared to the control group. Group 2 had reduced IFN-γ values 230.5 (±67,17) 250 pg/ml ($p < 0.05$). There was an increase in mucus production in groups 2, 342.99 (±79) and 5, 295.22 (±65,44) ($p < 0.001$).
Conclusion: PD can influence lung inflammation in experimental model. However, group 3 presented an improvement in pulmonary inflammation after PD associated with PDT.

TOLERANCE OF A LOW-LEVEL BLUE AND RED LIGHT THERAPY ACNE MASK IN ACNE PATIENTS WITH SENSITIVE SKIN

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Background: Acne and sensitive skin are often associated, due to the involvement of an impaired skin barrier in both conditions, which can be further aggravated by certain topical acne treatments. Often, treatment-induced signs and symptoms of irritation can lead to poor patient compliance and dissatisfaction with treatment outcomes. Therefore, a non-topical, chemical-free treatment that is well-tolerated by patients with acne and self-perceived sensitive skin is highly desirable. The benefits of red and blue light therapy in the treatment of mild to moderate acne are well known, with blue light reported to target acne-causing bacteria and red light demonstrating anti-inflammatory activity. Recently, clinical evidence reported on the ability of new low-level red and blue light therapy technology to effectively reduce both inflammatory and non-inflammatory lesions.
Study Design/Materials and Method: A 4-week, open-label clinical study was conducted to evaluate the tolerance of a new low-level blue and red light therapy technology (acne mask) in males and females (12–40 years of age) with mild to moderate acne and self-perceived sensitive skin. The acne mask provided simultaneous low-level blue and red exposure to the face in a single-step, and was performed at home. Objective cutaneous tolerance attributes were evaluated by the Investigator and sensory irritation was self-assessed by the patients.
Results: The acne mask was well-tolerated over the 4-week study, with no treatment-related adverse events. In addition, the patients agreed that the acne mask was comfortable and gentle to their sensitive skin, including those subjects who had experienced irritation to topical acne treatments in the past.
Conclusion: This clinical study confirms that a new low-level blue and red light therapy acne mask provides a chemical and UV-free treatment option for mild-to-moderate acne patients with sensitive skin, including those who have experienced sensitivity to topical acne treatments.

TREATMENT ALGORITHM FOR EXTRA-MAMMARY PAGET'S DISEASE USING THE CARBON DIOXIDE LASER—A PILOT STUDY

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Background: Extra-mammary Paget's disease of the vulva is a rare intraepithelial non-squamous adenocarcinoma of the skin that accounts for about 1% of all vulvar cancers. Most commonly pursued treatment alternatives include surgical modalities such as Mohs micrographic surgery or radical vulvectomy with or without lymphadenectomy. Unfortunately, it is frequent for patients to experience recurrences, as clear margins are difficult to achieve given this disease is often multi-focal. Reported local recurrence rates following surgery range from 34% to 56%. Additional treatment options that have been reported in the scientific literature include topical imiquimod

cream, topical 5-fluorouracil, radiation therapy, ALA and photodynamic therapy, systemic chemotherapy and carbon dioxide laser ablation.
Study Design/Materials and Method: This is a pilot study with a single patient where we present a treatment algorithm for the use of fractionated carbon dioxide laser and topical imiquimod in a case of unresectable Extra-mammary Paget's disease.
Results: Given the extent of the patient's disease, multi-focality and history of multiple failed excisions, Mohs micrographic surgery was not recommended. The patient was treated with a combination of fractionated carbon dioxide laser at fluences of 100 mJ, 125 mJ and 150 mJ and topical imiquimod 5% cream.
Conclusion: This study provides a viable alternative for treatment for Extramammary Paget's disease that is surgically unresectable.

TREATMENT OF FOLLICULITIS DECALVANS WITH CONVENTIONAL AND DAYLIGHT PHOTODYNAMIC THERAPY

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Background: A 41-year-old Caucasian male was diagnosed with folliculitis decalvans at 29. This condition has been treated with cyclin, isotretinoine, topical cortoid, amoxicillin and rifampicine, high posology of zinc, disulone, topical tacrolimus and corticotherapy *in situ* without any success. Scarring alopecia progressed and frequency of the outbreaks of follicular pustules increased.
Study Design/Materials and Method: In 2016, we observed some patches of scarring alopecia at the expanding margins of which are follicular pustules. DLQI was poor and the patient was highly embarrassed by the social discomfort and his painful scalp. We proposed a treatment by photodynamic therapy, based on its anti-inflammatory effects. The patient gave his informed consent. We performed 3 sessions 1-month apart using topical methylaminolevulinate (Galderma) and red light-illumination (Galderma) at 37 J/cm2 after 180 minutes of incubation at obscurity. The procedure induced a severe and diffuse pain (EVA = 8). After the procedure, we observed erythema, oedema at the margins and the patient reported minor pain over the treated area. These side effects were resolved within 3 days. At one month after the first session, the patient describes a significant improvement of his quality of life and he decided to stop disulone.
Results: After 3 sessions at one-month interval, we observed a total clearance of the pustules, DLQI was radically increased. Since the first session, alopecia area didn't expand. 3 months later, the patient describes a recurrence of hitching and a few follicular pustules were observed. We performed 3 sessions at 1-month apart using methylaminolevulinate and daylight illumination during 150 minutes (Daylight PDT). Procedure was painless (EVA = 0) and side effects were similar but shorter (24 hours). The same benefits were observed at 1 and 3 months. According this patient, PDT is the only effective treatment.
Conclusion: We reported one case of folliculitis decalvans treated by conventional then daylight PDT with satisfactory results.

TREATMENT OF TRICHOEPITHELIOMAS WITH Er:YAG CUTANEOUS LASER RESURFACING IN A FEMALE WITH BROOKE-SPIEGLER SYNDROME

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Background: Brooke-Spiegler Syndrome is a genodermatosis caused by mutations in the CYLD gene and is characterized by the development of adnexal tumors such as spiradenomas, trichoepitheliomas, and cylindromas. Surgical excision serves as the mainstay treatment of these tumors. However, laser resurfacing technology may provide an effective less invasive treatment modality.
Study Design/Materials and Method: This case study was performed at the Veterans Affairs Medical Center in Washington, DC.
Results: This is a case of a 55-year-old Caucasian female with no remarkable past medical history who presented to dermatology clinic with, golf ball sized, skin-colored subcutaneous nodules on the scalp and numerous asymptomatic, firm, shiny papules on the face. She stated that the lesions began developing in her 30s and were now leading to visual and nasal airway passage obstruction. In the past, she had approximately 20 lesions surgically excised and also attempted a course of topical imiquimod therapy without resolution. Of note, she had a remarkable family history of similar lesions in her mother, maternal grandfather, maternal uncles and aunts, maternal cousins, two brothers, and one sister. The patient was referred to Plastic Surgery for excision of a larger, symptomatic scalp lesions which were consistent with cylindromas. Histopathology of multiple facial lesions was consistent with trichoepithelioma. Genetic testing confirmed CLYD mutation consistent with Brooke-Spiegler Syndrome. We attempted treatment of her refractory facial trichoepitheliomas with a 2940 nm Er:YAG laser, which proved successful.
Conclusion: This case study highlights the efficacy of Er:YAG lasers in the treatment of trichoepitheliomas in a patient with Brooke-Spiegler Syndrome. Ablative laser resurfacing may provide a non-surgical approach compared to conventional excision for the treatment of persistent facial trichoepitheliomas.

USE OF LOW FLUENCE Q-SWITCHED Nd:YAG FOR CLEARANCE OF HYPERPIGMENTATION: SEQUELAE OF SUBACUTE CUTANEOUS LUPUS ERYTHEMATOSUS

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Background: Subacute cutaneous lupus erythematosus (SCLE) is an autoimmune condition in which a lymphohistiocytic interface dermatitis occurs, often resulting in pigmentary dropout. Although SCLE is a non-scarring condition, melanin accumulates in the macrophages in the papillary dermis and post-inflammatory hyperpigmentation (PIH) ensues as a common disfiguring hallmark. As topical preparations are ineffective, specific laser-tissue interaction is necessary to disrupt deep pigment and enhance phagocytosis.
Study Design/Materials and Method: A forty-year-old woman (Fitzpatrick II) presented with asymptomatic ill-defined tan patches on her chest, upper extremities, and back. She had been successfully treated for terbinafine-induced SCLE one year earlier with prednisone and then methotrexate. The resultant hyperpigmentation had not responded to azeleic acid or hydroquinone. Multiple laser test sites were performed to ensure safety; lasers tested included pulsed dye laser with compressed lens, intense pulsed light, QS Nd:YAG, and non-ablative thulium laser.

Results: None of the laser tests produced any blistering, textural change, or unintended pigmentary alteration. However, the low fluence QS Nd:YAG parameters (5 mm, 2.25 J/cm^2, 5 Hz) showed significant clinical improvement and was well-tolerated during and post-procedure. Two full treatments of the affected areas were then performed one month apart. Follow-up one year later confirmed persistent clinical improvement and two additional treatments were performed. There were no side effects experienced during the two years of observation.
Conclusion: The 1064 nm wavelength of the QS Nd:YAG enables penetration, while minimally affecting uninvolved melanin at the dermal-epidermal junction. The thermal relaxation time of melanin-containing structures coupled with a nanosecond pulse duration allows photoacoustic fragmentation of melanin-containing particles. This enables phagocytosis of melanin which in turn results in clinical clearance of dark patches. For a clinically-stable patient with PIH from SCLE; low fluence QS Nd:YAG appears to be a safe, comfortable, and efficacious laser treatment with long-lasting results.

USE OF OPTICAL COHERENCE TOMOGRAPHY IN HYBRID LASER RESURFACING

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Background: Optical coherence tomography (OCT) provides real-time *in vivo* imaging of skin structures including blood vessels and capillaries and providing precise measurements of their depth and density. This allows us to treat these blood vessels with parameters tailored to the size and depth of the vessels.
Study Design/Materials and Method: 25 patients being treated with the fractional hybrid laser (Sciton) were scanned with OCT device (Michelson Diagnostics Ltd) prior to treatment. OCT was used to determine the depth and position of blood vessels that were targeted. OCT images were then used intra-operatively to determine optimal settings.
Results: Under OCT guidance the settings used differed from prior settings routinely used and resulted in considerable clearing and improved aesthetic result. OCT immediate and late post scans confirmed vessel destruction.
Conclusion: OCT is a very useful technology to help determine optimal laser settings for vascular treatment with a hybrid fractional laser.

VASCULAR MONITORING OF PROSTATE CANCER TREATMENT

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Background: Prostate cancer of low grade may be followed clinically but PSA is not accurate in many cases. 3D vessel histogram analysis is available to quantify changes in tumor vessel density non-invasively avoiding biopsies.
Study Design/Materials and Method: From 1990–2010 over 50,000 3D Doppler sonograms were performed on men with low grade prostate cancer. Vessel histogram analysis was performed on a 6 month routine.
Results: Patients with low grade cancer demonstrated no increase in tumor neovascularity in 95% of this study and continued routine follow up. 5% of patients developed higher grade tumors and were biopsied and received definitive therapy.
Conclusion: Non-invasive vascular imaging by 3D Doppler is highly predictive of tumor aggression. This is important since dying cancers can develop cystic internal necrosis that enlarges the lesion simulating tumor progression.