Ablative Laser Therapy of Skin

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KEYWORDS

• Ablative laser therapy • Thermal relaxation time of skin • Fully ablative resurfacing
• Fractional resurfacing • Carbon dioxide resurfacing • Chromophore

KEY POINTS

- Skin rejuvenation continues to be one of the most popular requested cosmetic procedures.
- Ablative lasers vaporize the tissue, removing all or part of the skin surface in the treatment area. The damaged skin undergoes healing processes and is replaced with healthy tissue.
- The most common indications for both full-field and fractional laser resurfacing are superficial dyschromias, dermatoheliosis, textural anomalies, superficial to deep rhytids, acne scars, and surgical scars.
- Using treatment parameters that combine depth of injury, energy of ablation, and density can provide safe and reliable treatments and consistent outcomes.
- Treatment should be tailored according to each patient's specific needs, skin characteristics, and treatment area.

Video content accompanies this article at http://www.facialplastic.theclinics.com.

INTRODUCTION

Ablative laser skin resurfacing is used for removing superficial dermal layers of the skin to reduce cutaneous signs of photoaging as well as for treatment of facial wrinkles, acne and surgical scars, traumatic scars, and numerous types of superficial skin lesions, and to enhance the effects of facial plastic surgery, such as facelift and blepharoplasty.

History of the Development of Ablative Lasers for Skin Therapy

Continuous-wave carbon dioxide (CO_2) lasers for skin resurfacing were introduced in the 1980s, gaining popularity and often replacing chemical peels and dermabrasion. The 10,600-nm CO_2 laser wavelength is absorbed by its primary chromophore, water, which is heated, vaporizing the tissue and removing the entire skin surface in the treatment area. The depth of injury is determined by the energy level applied. At the time of its introduction into clinical use, resurfacing using the CO_2 laser required high operator skill due to pulse width and power constraints. Continuous-wave devices could either be used at high power, which caused less thermal damage but vaporization depth was difficult to control due to the need to sweep over the skin swiftly and uniformly, or at low power, which helped control penetration depth but could cause excessive thermal damage. As a result, the extent of tissue destruction was unpredictable and was associated with unacceptable risks of impaired wound healing and scarring.[1–3]

In an attempt to minimize complications, short-pulse laser devices were developed, which exposed the tissue to less than 1 msec of laser energy at a time, allowing tissue ablation with limited residual thermal damage of approximately 75 to 100 μm. Despite excellent improvement of wrinkle appearance and skin laxity tightening within a

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short period of time, this technology was associated with significant downtime as well as long-term hypopigmentation in a large proportion of patients.[4]

The erbium-doped yttrium aluminum garnet (Er:YAG) laser, which delivers energy at 2940 nm was introduced at the turn of the century. As 2940 nm is at the peak of water absorption, vaporization is the primary mode of action, whereas coagulation is minimal and diffusion of heat to surrounding tissue is greatly reduced, lowering the risk of scarring and damage to pilosebaceous units.[5] The delivered energy density (fluence) of the Er:YAG laser is linearly correlated with the depth of tissue ablated, with 3 to 4 μm of tissue removed per J/cm^2; thus, multiple passes can be used to produce deeper tissue removal without additive residual thermal injury. As a result, the recovery time to full epithelialization after deep full-field Er:YAG laser resurfacing is 7 to 10 days followed by 3 to 6 weeks of erythema. Comparative studies have shown that the combined depth of ablation and coagulation determined the length of recovery following the use of Er:YAG lasers.[6,7] Variable or long-pulse Er:YAG lasers enable controlling the amount of residual thermal injury produced for a given amount of tissue removal. Comparison of Er:YAG to CO_2 resurfacing showed more long-term wound contraction and fibroplasia with CO_2 treatments.[8]

Additional advances in skin resurfacing techniques occurred with the introduction of fractional photothermolysis technology, whereby the laser beam is manipulated through a diffractive lens, creating multiple microscopic laser beams. Each microscopic laser energy beam creates small columns (< 400 μm in diameter) of thermal damage, called microscopic thermal zones (MTZs), whose penetration depth is proportional to the laser energy emitted. Fractionating the pulsed ablative laser energy that covers only a fraction of the treated area (approximately 5%–30%) enables rapid reepithelialization from the undamaged, adjacent epidermis separating the MTZs, facilitating repair and remodeling of the epidermis and dermis.[9] Histologically, the MTZ of ablative fractionated laser comprise a central column of stratum corneum, epidermal, and dermal ablation lined by a thin eschar and surrounded by an annular coagulation zone (penumbra).[10,11] In contrast to full-field resurfacing whereby healing occurs from deep structures only, healing following ablative fractional photothermolysis occurs from adjacent structures as well as from deeper structures. This less destructive technology further reduced the incidence of adverse events and increased the degree of therapeutic control[12]; however, multiple treatments were required and the clinical response was more limited compared with full-field ablative resurfacing.[11,13]

As ablative lasers vaporize tissue, their effect is more "destructive" with longer downtime and recovery compared with nonablative lasers that leave the skin intact. Nevertheless, they result in better improvements when treating severe facial wrinkles, dyspigmentation, and textural skin.

Depending on the indication, the technician may choose to use a specific ablative laser (eg, CO_2 or Er:YAG) with a multitude of different settings, including fractional versus nonfractional, to achieve the desired result and, more importantly, minimize laser-associated complications such as scarring, persistent erythema, and dyspigmentation.

Patient Selection

Careful patient selection and knowledge of potential complications are essential for achieving consistent results. The initial consultation should begin with an evaluation of the patient's ethnicity, skin type, and degree of photodamage. Darker skin types (IV–VI) have increased epidermal melanin, larger and more widely distributed melanosomes, and reactive fibroblasts,[14]which result in a tendency for hyperpigmentation in response to light stimuli or trauma.[15] The characteristics of photoaging differ by ethnicity. For example, photoaging in Asian individuals is characterized by pigmentary alterations, lentigines, and seborrheic keratoses rather than fine lines and deep rhytids observed in Caucasian individuals.[16,17]

Understanding patients' expectations in an esthetic treatment is crucial. For example, ablative laser resurfacing may be used for improving tone, texture, and wrinkles but it is not a substitute for a facelift or a necklift. During the initial consult, the treating physician should discuss healing times and the return to social and work-related activities. These timelines will affect the type and intensity of the treatment rendered.

The most common indications for both full-field and fractional laser resurfacing are superficial dyschromias, dermatoheliosis, textural anomalies, superficial to deep rhytids, acne scars, and surgical scars. Other conditions that may respond favorably include rhinophyma, sebaceous hyperplasia, xanthelasma, syringomas, actinic cheilitis, and diffuse actinic keratoses. Dyschromias such as melasma have been successfully treated with fractional resurfacing but results are not consistent. Better treatments for melasma currently exist, particularly with the advent and use of tranexamic acid accompanied by nonablative neodymium-doped YAG laser treatments.

Pretreatment Considerations

Herpes simplex virus 1 reactivation may occur in patients undergoing ablative facial laser resurfacing and may delay healing and result in severe scarring[18]; therefore, antivirals should be prescribed to every patient.[19–21]

Ablative resurfacing can produce a myriad of wounds from very superficial epidermal injuries to deeper dermal wounds. The extent of the wound healing period and the final cosmetic outcome depend on the preoperative and post-resurfacing care regimes.[22] Bacterial infection after laser skin resurfacing may affect healing by increasing the depth of the original wound and delaying reepithelialization, consequently increasing the risk of persistent erythema, dyschromias, and scarring.[23] Infections are sometimes noticeable only in the second week after the procedure.[24] Infectious agents identified following laser resurfacing procedures were similar to those reported for burn injuries, including *Pseudomonas aeruginosa, Staphylococcus aureus, Staphylococcus epidermis, and Staphylococcus aureus*.[25,26] Prophylactic oral antibiotics should be prescribed to prevent secondary bacterial infection.[23] Oral antibiotics should be started 1 day before the procedure and be continued until reepithelialization has been completed.[20,21,24]

Although it is debated whether pretreatment with topical bleaching agents, such as hydroquinone cream, reduce the risk of post-inflammatory hyperpigmentation after laser resurfacing,[27,28] this has been shown in darker skin types, especially after laser resurfacing.[28]

Patients who were exposed to the sun or actively tanned should wait until the tan fades (2–4 weeks) before starting ablative laser therapy.[29]

Posttreatment

Treatment with any ablative laser system involves a healing phase that usually lasts 5 to 10 days.

The lack of postablative laser treatment protocols was responsible to some degree for the demise of ablative CO_2 use in the 1990s. Posttreatment care should be diligent and the physician must be involved in all of its care aspects.

Application of topical corticosteroids immediately after ablative skin resurfacing treatment has been shown to effectively decrease post-inflammatory hyperpigmentation, especially in individuals with dark skin types.[30] The persistent use of corticosteroids may however significantly reduce the expression of messenger RNA and significantly reduce the amount of collagen regeneration post-procedure.[31] Mineral sunblocks that contain titanium dioxide or zinc oxide prevent potential sensitization effects associated with the use of chemical sunscreens.[32,33] Topical skin bleachers/lighteners, such as ascorbic, tranexamic, glycolic and kojic acids, and hydroquinone, may be used for treating hyperpigmentation after erythema has subsided.[22,34,35]

Thermal damage may cause localized immunosuppression that may lead to a secondary infection.[36] The use of topical antibiotics to prevent infection during wound healing is limited by the risk of contact dermatitis in laser-abraded skin.[4,20,23,37]

Antivirals should continue to be used after the treatment to prevent herpes simplex virus 1 reactivation.[19–21]

I currently use a formulated perfluorodecalin product which has been shown to accelerate wound healing and significantly reduce postprocedure complications including persistent erythema, acneiform eruptions, and delayed healing.[38]

Treatment Parameters

When planning an ablative resurfacing treatment for any area of the body, three factors must be considered: energy used, density, and the pulsed duration of the laser. As skin depth differs throughout the face and body, it is imperative to consider skin depth when selecting the appropriate energy level. New technology lasers, such as the Lumenis Alpha UltraPulse, now provide depth of injury parameters as energy levels are selected. The density must also be adjusted according to the treatment area and the depth of injury. Fully ablative treatments remove the entire surface area of the treated zone. The wound or depth of injury can be very superficial, affecting the epidermis only, or it can reach papillary or reticular dermal elements. Deeper penetration into the reticular dermis must be fractionated and should be reserved for facial treatments. Creating an injury that extends into the reticular dermis in non-facial areas has been shown to significantly increase the risk of scarring (**Fig. 1**). The pulsed duration of the laser must also be considered. The thermal relaxation time (TRT) of skin is approximately 8 msec.[39] The ability to lase and successfully ablate skin within the TRT significantly reduces the risk of additional coagulation, thereby preventing the enlargement of the laser ablation wound, which essentially affects the density of the rendered treatment. Longer pulsed lasers that mimic the early scanner type devices are known to create wounds with significantly longer wound healing times and increased complications. The primary reason for this phenomenon is the time on tissue or pulse width.

I have been using the UltraPulse CO_2 Laser System (Lumenis BE, Yokne'am, Israel) since 2008.

Fig. 1. Penetration into the reticular dermis in nonfacial areas has been shown to significantly increase the risk of scarring. The photo depicts a neck 7 days after fractional erbium resurfacing.

The settings described below reflect my experience with this device.

Periorbital Treatment

Changes around the eyes are often among the first perceived signs of facial aging. Fractional CO_2 laser treatment is a useful noninvasive alternative to blepharoplasty for reestablishing a more youthful appearance. In addition, it is a valuable adjunct to blepharoplasty to improve the textural changes associated with aging.

Common treatment parameters for this area include a fractionated treatment around the lateral canthal area at an injury depth of approximately 550 μm using energy of 15 mJ and 20% density. The DeepFX scanner (Lumenis) is set to a density of 10%, and two passes are completed. Recent advances with a randomized deep mode have demonstrated the ability to increase density to approximately 20% in a single pass without significant changes in healing. The area is then treated with the superficial Active FX scanner (Lumenis) at 80 mJ with a density of approximately 50%. The laser must not be used to treat the area below the supratarsal fold on the eyelid. In addition, metal eye shields should be used in all cases of facial skin resurfacing. At these settings, the depth of injury using the superficial scanner reaches the papillary dermis of the eyelid skin. Decreasing the density has proven to minimize the risk of scarring or ectropion related to resurfacing.[40,41] I have found no occurrences of delayed healing or ectropion with these parameters.

Treatment benefits include improvement or disappearance of mild to moderate rhytids, improved skin texture and tone, decreased pore size, and improvement and reduction in skin laxity (**Fig. 2**)

Perioral Treatment

The perioral area often requires a more aggressive treatment. Because the epidermis and papillary dermis in the perioral area approach a depth of 250 μm,[42] higher energy settings may be safely used. Commonly, a deep scanner is used at a density of 15% and energy of 17.5 mJ to reach a depth of 600 μm. With this setting, two passes may be safely performed. Once completed, the superficial scanner may be used at 100 to 125 mJ with a density setting of 80%. This will essentially remove all of the epidermal and some papillary dermal components, resulting in a deeper injury consistent with a second-degree burn. This more aggressive treatment will require approximately 10 days to heal (**Fig. 3**).

Hand Rejuvenation

Rejuvenation of the hands continues to be an interest of many patients. Ablative laser treatment combined with a filler, such as fat or calcium hydroxylapatite, can significantly improve the appearance of the hands. Typically, the dorsal area of the hands is prepared for a sterile injection technique. A small amount of local anesthesia is placed between the four knuckles. A 25-gauge cannula is used for injecting the calcium hydroxylapatite, whereas a 19 gauge cannula is used for injecting fat. To provide additional comfort, a small amount of lidocaine is mixed with the fat before injection. Once the injection is completed, the hands are superficially lasered at a power setting of 80 mJ and 50% density. The healing process usually takes about 2 weeks, with few limitations. The laser power settings typically cause minimal crusting, and most patients find recovery simple.

Neck Rejuvenation

The aging neck is characterized by lipodystrophy, platysmal bands, and jowls that extend into the neck.[43] As jowls develop, the chin and jawline lose definition and horizontal and radial necklines become more noticeable.[44] Like the face, the neck is subject to photodamage.[45] Patients who seek facial rejuvenation often request a neck treatment to ensure a homogenous and completely rejuvenated face and neck.

The use of CO_2 laser for neck skin rejuvenation has been described in several studies.[46–49] Reports of scarring have raised concerns about deep neck treatments.[50,51]

Before starting neck skin rejuvenation, it is crucial that the expectations of both the surgeon and patient are aligned. It is important to understand that aggressive deep neck treatments are

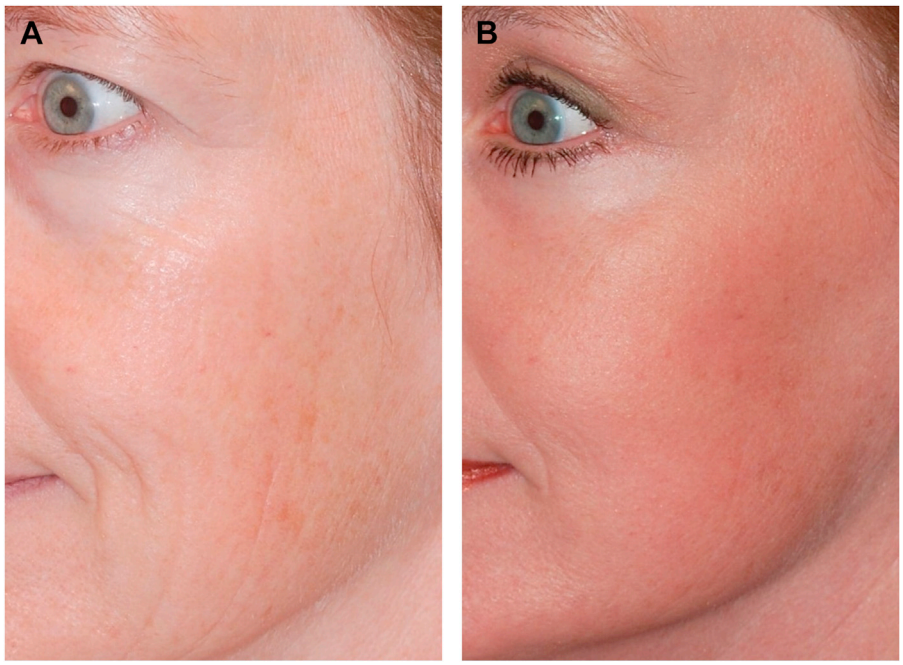

Fig. 2. A female patient (*A*) before and (*B*) 3 months after undergoing blepharoplasty and facelift with combined deep and superficial CO_2 resurfacing. Note the significant improvement in the quality of the skin.

not a replacement for neck and facelift surgery and therefore should not be performed. Attempts to injure the platysma muscle to elevate and tighten it should not be performed with an ablative laser. The key components of the neck skin should be considered when planning treatment. Beyond the first cervical crease, the neck skin is deplete of skin adnexal structures; therefore, laser treatment parameters must be modified significantly to safely treat this area. The skin above the first cervical crease is more similar histologically to facial skin, and settings can be similar to those used for treating facial skin along the jawline. During facelift and necklift surgery, the neck is treated to

Fig. 3. A 74-year-old patient (*A*) before and (*B*) 11 days after undergoing a facelift and fat grafting with combined deep and superficial CO_2 resurfacing. The early result at 11 days indicates acceptable healing times even with combined therapy.

improve the overall skin texture, but additional tightening is usually not performed. Completely undermined neck skin may be treated safely with ablative CO_2 laser using the UltraPulse device at an energy setting of 80 mJ, with a density of 50% and a frequency of 250 Hz.

Treatment of Scars

Ablative fractional CO_2 laser is currently considered the gold standard treatment for hypertrophic scarring. The use of the CO_2 laser for treatment of facial acne scarring was reported in four studies. In a study on 25 patients aged 17 to 62 years, patients demonstrated overall improvement of acne scarring with significantly greater degrees of improvement in the forehead, perioral region, and medial cheek compared with the temple and lateral cheek. There were no cases of prolonged hyperpigmentation or erythema persisting beyond 3 months and no long-term complications were reported.[52] Histologic examination of skin biopsy specimens from nine patients (age range, 25–41 years, Fitzpatrick skin types I–IV) taken immediately after treatment with the CO_2 laser showed full-thickness loss of epidermis with formation of a homogeneous hypereosinophilic zone of thermal damage in the papillary dermis, extending focally into the reticular dermis. Skin biopsy specimens taken after 3 months showed a thick band of papillary dermal fibrosis in skin treated with the CO_2 laser.[53] Vaporization depth and residual thermal damage following use of the "superficial" or "deep" scanning modes of the 40 W continuous-wave CO_2 laser was similar in biopsies taken from 14 patients aged 24 to 54 years with Fitzpatrick skin type I–IV.[54] Moderate to severe acne scars significantly improved following treatment with the CO_2 laser using a "double-layer" technique.[55] Varying degrees of pain, erythema, edema, oozing of blood, and exudate were observed immediately after each treatment. Two cases (10%) of persistent erythema were reported which lasted for 2 to 3 days and two cases (10%) of hyperpigmentation which lasted 3 to 5 days. Average downtime was 6 days.

The use of the CO_2 laser was found to be a highly effective therapy for management of the persistent, scarred, and sinus tract lesions of hidradenitis suppurativa.[56,57] Madan and colleagues[57] reported on CO_2 laser treatment of recalcitrant hidradenitis suppurativa in nine patients aged 27 to 52 years who had failed to improve on medical and other surgical treatments. Mean wound healing time was 2 weeks (range 1–4). Good clinical results, evidenced by absence of active discharging lesions at the treatment sites, were seen in seven patients with no recurrence at 12-month of follow-up. Six patients reported that their hidradenitis suppurativa was inactive 12 months after the laser treatment. Two patients still had active hidradenitis suppurativa at untreated sites adjacent to treated sites within the anatomical unit. One patient developed discharging lesions at treated sites 3 months after surgery. Further laser treatment at this site was effective in achieving remission. Seven patients were able to discontinue all systemic treatments without relapse. Scar contracture not restricting limb mobility was noted in two patients. Hazen and Hazen[56] reported on treatment of 61 patients aged 21 to 73 years. Following treatment with the CO_2 laser, all patients healed with cosmetic and comfort qualities deemed acceptable to excellent in all areas. There were no instances of reduced range of motion. Follow-up after treatment noted an average of 4.1 years without disease recurrence in treated areas (range 1–17 years).

Acikel and colleagues[58] investigated the effectiveness of CO_2 laser resurfacing and thin skin grafting in camouflaging self-inflicted razor blade incision scars in the upper arm, forearm, and anterior chest of 16 white male patients aged 16 to 41 years. All of the procedures were successful, and the postoperative course was uneventful for all of the patients. Skin graft donor sites healed in 5 to 7 days. Hair growth through the skin graft was excellent, and normal hair patterns were regained over the treatment sites. Eighty percent of the existing hypertrophic scars were totally resolved after the operation; 20% of hypertrophic scars showed a tendency to recur and responded well to repetitive intralesional steroid injections and silicone gel sheeting. Complications included partial graft loss on the anterior chest caused by inadequate immobilization was observed in one patient and the wound reepithelialized spontaneously. Significant hyperpigmentation developed in one patient who did not protect the grafted area from sunlight. Small inclusion cysts were observed in five patients in the early postoperative period, which were treated by opening the top of the cyst and removing the contents.

Du and colleagues[59] reported apparent esthetic scar improvement following CO_2 laser treatment before skin suture during scar revision surgery in 10 patients aged 22 to 47 years with Fitzpatrick skin types III–IV. Erythema was resolved within 3 months in all of the cases. No cases of permanent hyperpigmentation, hypopigmentation, or scar hyperplasia were observed.

Zhang and colleagues[60] compared the outcomes of treatment of fresh surgical scars longer than 2 cm in the neck and face with CO_2 laser to the outcomes of untreated surgical scars. All 18 patients in the treatment group had significant

improvements in their surgical scars after the laser therapy. Assessments from both patients and physicians were highly consistent. The overall effective rate was 100%, with excellent responses in 16 patients (88.9%) and good responses in two patients (11.1%). The most significant improvements were color, vascularity, and hardness, which all reached statistically significant differences before and after the treatment. Untreated scars improved statistically significant less than the CO_2-treated scars.

Combined Surgical and Ablative CO_2 Laser Treatments as an Adjunct to Facelift

The ability to safely resurface skin during facelift surgery is a key component of successful facial rejuvenation. For many years, it was considered unsafe to perform laser skin ablation on undermined skin during facelift/necklift. The procedures were commonly staged, and patients were treated later, after the facelift had healed, or areas of undermined skin were not treated. Chemical peels were often used in the perioral area, but not elsewhere. I performed 35% trichloroacetic acid peels during facelift surgery for some time, and although no scarring occurred, the results were inconsistent probably due to being cautious not to over penetrate the skin with the peeling solution. With the advent of more precise ablative laser technology, I began to use laser resurfacing in patients undergoing facelifts in 2008. The results of combined skin rejuvenation and facelift were dramatic, as the "canvas" had been completely rejuvenated as well. Currently, deep plan facelift is performed in my practice, but I do elevate a skin flap of approximately 5 to 6 cm before entering the deep plane. The areas over the deep plane and the more superficial skin-only flap are lased using the same settings. I have not encountered skin loss in these areas with over 1500 cases of combined facelift and laser skin ablation. Treatment parameters are typically 90 to 100 mJ with 70% to 80% density. The neck is commonly treated as using energy of 70 to 80 mJ with 50% density.

The simultaneous treatment of facelift and ablative laser skin rejuvenation significantly improves the final results of facial rejuvenation. Patients are extremely satisfied with the adjunctive procedure, and do not find the healing time of 1 week a significant issue. The UltraPulse device used by the author possesses a coherent beam. Coupled with the ultra-short pulse duration, a painting technique is used to reach the desired density without creating any stamping or true delineation of lased and non-lased skin. The attached video demonstrates this technique (Video 1)

Case study 1

A 54-year-old patient had extensive weight loss over 18 months and chose to have facial rejuvenation. She was interested in having a natural look and wanted to see some improvement in her photoaged skin. She underwent an endoscopic brow lift, upper and lower lid blepharoplasty, and a deep-plane facelift. Fat grafting was also performed as well as a full face and neck CO_2 resurfacing procedure. CO_2 treatment settings were 100 mJ at a density of 80% and a frequency of 250 Hz (**Fig. 4**).

Case study 2

A 52-year-old patient with extensive sun exposure was seen in consultation for facial rejuvenation. Her extensive sun exposure and long history of smoking presented several concerns regarding treatment, including the simultaneous use of laser resurfacing during a surgical procedure. The patient underwent an endoscopic brow lift, facelift, upper and lower blepharoplasty, fat grafting, and full face and neck laser resurfacing with the CO_2 laser (settings: energy 90 mJ, 90% density, frequency 250 Hz, depth of injury approximately 80 μm).

Fig. 4. Frontal view before (*A*) and 1 month after surgery (*B*). Lateral view before (*C*) and 1 month after surgery (*D*).

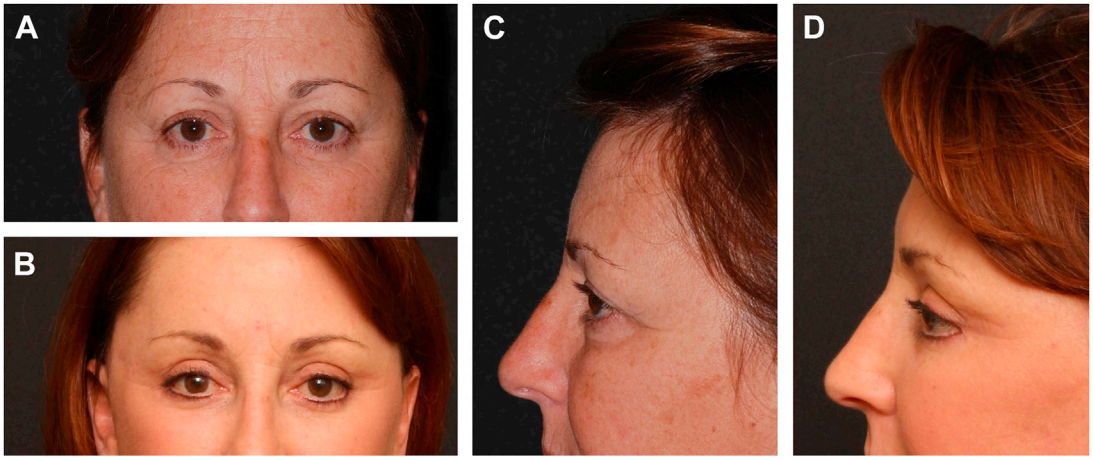

Fig. 5. Frontal view before (*A*) and 3 months after surgery (*B*). Lateral view before (*C*) and 3 months after surgery (*D*).

Although her face healed without complications, she did have a small amount of skin loss in the postauricular area which was not lased (**Fig. 5**).

Case study 3

A 74-year-old patient requested to treat her smoker's lines in the perioral area. She also requested complete facial rejuvenation, including an endoscopic brow lift, facelift, upper and lower blepharoplasty, and full-face skin resurfacing. The perioral area was treated with 125 mJ, 100% density, and a frequency of 250 Hz. Once the eschar was removed, a second pass was performed at 80 mJ, 50% density, and 250 Hz (**Fig. 6**).

DISCUSSION

Ablative laser skin resurfacing is a very powerful treatment of patients who desire an improvement in the quality of their skin. As a stand-alone procedure, it can significantly improve fine wrinkles, pigmentation issues, and actinic keratosis. When used in conjunction with deep fractional resurfacing, volumetric reduction may occur, which can reduce the general surface area of the treatment area

Fig. 6. Frontal view before (*A*) and 3 months after surgery (*B*).

and decrease the apparent laxity. When used in conjunction with a surgical procedure such as facelift, skin rejuvenation includes additional tightening and collagen restoration along with a completely fresh "canvas." These outcomes provide a significant benefit and joy to the patient's experience.

Skin resurfacing relies on the laser device to provide safe ablation and coagulation in a finite period to prevent overheating and over-ablation or coagulation. Longer duration treatments outside the TRT of skin account for unsuspected complications such as burns or an extremely long healing duration. Many devices are suitable for skin resurfacing, but the physician must be provided with complete information (eg, treatment settings, how to correctly operate the device and its handpieces or scanners, how to avoid complications) to achieve a successful treatment.

Treatment should be tailored according to each patient's specific needs, skin characteristics, and treatment area. These parameters (eg, energy levels, treatment density, and frequency) must be noted in the patient's record. When necessary, changes within the treatment protocol for different treatment areas should also be noted in the patient record. Simply stating that laser resurfacing was performed is an incomplete record and provides room for significant scrutiny if complications were to occur.

Safe and effective laser skin resurfacing should be considered in most patients undergoing facial rejuvenation. The benefits significantly outweigh the associated risk when performed appropriately.

CLINICS CARE POINTS

- Careful patient selection and knowledge of potential complications are essential for achieving consistent results.
- Understanding patients' expectations in an esthetic treatment is crucial.
- Treatment should be tailored according to each patient's specific needs, skin characteristics, and treatment area.
- Posttreatment care should be diligent and the physician must be involved in all of its care aspects.
- The simultaneous treatment of facelift and ablative laser skin rejuvenation significantly improves the final results of facial rejuvenation.
- Learn all that you can about the laser you use and use it every day to perfect your treatment protocols.

DISCLOSURE

J.K. Duplechain is a member of the Speakers' bureau of Lumenis and Apyx Medical and reports ownership of Cutagenesis stock options.

SUPPLEMENTARY DATA

Supplementary data related to this article can be found online at https://doi.org/10.1016/j.fsc.2023.05.002.

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