

Hand Rejuvenation Using a Combination Approach

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BACKGROUND Hand rejuvenation has been recognized to play a key role in complementing and restoring an overall youthful look.

OBJECTIVE Aging hands present specific characteristics that require a carefully designed combinational treatment for a successful clinical outcome from a practitioner's and patient's perspective.

METHODS AND MATERIALS A Medline search was performed on hand rejuvenation from 1990 to 2015, and results are summarized. The authors' personal experiences with specific technologies are discussed.

RESULTS Review of available clinical studies revealed successful rejuvenation of the epidermis and dermis of the hands with topicals, chemical peels, intense pulsed light, and laser energy devices. Reports of sclerotherapy and laser veins ablation for dorsal hand veins were identified. Several studies on hand volume restoration with injectable volumetric fillers such as hyaluronic acid, calcium hydroxylapatite, poly-L-lactic acid, autologous fat transfer including the authors' personal experience with them are described.

CONCLUSION A plethora of noninvasive treatment options for hand rejuvenation have been thoroughly studied as monotherapy, but there is insufficient number of studies evaluating the best combination of therapies for this indication. It is likely that their strategic combination and sequence of application by a trained clinician will ensure a favorable outcome in addressing patient concerns.

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Rejuvenation of the aging body has largely focused on the face, and until recently, the hands were for the most part neglected. With the advent of new noninvasive technologies, their widespread availability and applicability in clinical practice, hand rejuvenation has been fully integrated in the holistic body rejuvenation approach with increasing number of patients appreciating and seeking out the beneficial effects of treatment.

Both intrinsic and extrinsic factors contribute to the main manifestations of the aged hand. Photo-damage, environmental factors, and intrinsic aging lead to the development of solar lentigines, seborrheic keratoses, actinic keratoses (AK), telangiectasias, and dyschromias. Loss of collagen and elastin fibers leads to thinner skin with decreased skin

elasticity, wrinkles, and translucent lax skin, whereas loss of volume due to subcutaneous fat, bone, and muscle atrophy makes the aged hand look skeletonized, appearing bony with prominent veins, joints, and tendons.

The scope of hand rejuvenation is to fully restore the characteristics of a youthful hand by targeting the 3 skin layers: normalizing the epidermal tone and color, increasing the dermal collagen, and restoring the depleted volume of soft tissue.

Careful consideration and knowledge of the hands anatomical characteristics is essential when considering a clinical treatment strategy, because the thin epidermis, low density of adnexal structures such as hair follicles, sebaceous glands, and dermal vessels exclude

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the utilization and suitability of certain techniques and technologies.

Epidermal Rejuvenation—Instigating Cell Turnover

Topical Agents

Popular topical agents that can address the signs of photoaging include tretinoin, α -hydroxy acid, vitamin C, other antioxidants, α -lipoic acid, penta-peptide, and cutaneous growth factors. Retinoids by reducing the rate of melanin transfer can correct pigmentary abnormalities and simultaneously stimulate the production of collagen in the dermis.¹ Although several multicenter, double-blind, placebo-controlled studies have demonstrated the effectiveness and safety of tretinoin for moderate to severe photodamage, none have specifically evaluated the effects on the aging hand.^{2,3} Nevertheless, they are commonly recommended for this indication.

Another common epidermal change seen on the dorsal surface of the hands is AK, typically red, scaly patches that may bleed or peel. There are multiple treatment options, including liquid nitrogen or topical antimetabolic agents such as 2% to 5% 5-fluorouracil (5-FU) or imiquimod. In 1 double-blind, vehicle-controlled study, 84% of subjects with AK in both facial and nonfacial areas using imiquimod 3 times per week for a total of 12 weeks achieved total clearance after only 2 weeks into the 12-week intended treatment time.⁴ Another treatment option for AK, that frequently coexists with photodamaged skin, is photodynamic therapy (PDT). The technique uses the application of a topical agent followed by activation with an intense pulsed light (IPL) device or a blue light device. In a single-site study, this protocol was shown to improve both AK and photodamage, with results lasting for more than 6 months.⁵ In another side-by-side comparison study, PDT was equally as effective as topical 5-FU in clearing approximately 70% of AK of the backs of the hands.⁶ Combination of multiple, instead of single, light, and laser sources in PDT for AK has been shown to result in superior clinical effects.⁷ Multiple studies have also demonstrated that pre-treatment of AK with either 5-FU or imiquimod 5%

cream is an effective treatment strategy that reduces the risk of recurrence.⁸ In a small case series, treatment with sequential 5-FU and ALA-PDT in 3 male patients with AK, when compared with ALA-PDT alone, was more effective, minimized the recurrence of areas of field cancerization and improved the appearance of the skin.⁹

Chemical Peels

The most economical treatment modalities for epidermal rejuvenation are chemical peels, primarily used to address mild pigmentary alterations.¹⁰ Depending on the concentration of the solution used (glycolic acid, Jessner's solution, or trichloroacetic acid), they can be classified as superficial, medium, and deep. Owing to the paucity of adnexal structures and thin epidermis of the hands, superficial peels are recommended to reduce the risk of scarring and persistent erythema. Few clinical studies have evaluated the use of chemical peels on the hand. A study using a 35% to 45% trichloroacetic acid gel layered over a 70% glycolic acid gel on the hands showed improved skin texture, normalized tone without any adverse effects.¹¹

Intense Pulsed Light

Intense pulsed light devices are usually the first choice of energy device for hand rejuvenation because they can simultaneously correct vascular and pigmented lesions of the entire dorsal surface of the hand.¹⁰ The broad-spectrum of emitted light (515–1,200 nm) facilitates the selective treatment of targets with different absorption spectrum, whereas the cutoff filters can adjust the treatment to control the depth of penetration and account for different skin types. In addition to improving vascular and pigmented lesions, dermal heating from IPL therapy, which spares the epidermis, has been demonstrated to induce neocollagenesis in the papillary and reticular dermis, accounting for the observed global improvement in skin texture.^{12–14} IPL devices typically treat the skin surface with a large footprint for each pulse and often only 15 pulses per hand are necessary. In a pivotal study, 23 patients with moderate photodamage on the dorsal hands treated with 4 IPL sessions at 3-week to 4-week intervals showed 100% improvement of

pigmentary and skin quality changes, with no significant side effects.¹⁵ Intense pulsed light devices are routinely combined with other laser devices such as fractional lasers or Q-switched (QS) lasers to optimize treatment according to the individual patient nuances. For example, an IPL followed by pulse stacking with a QS laser over macular seborrheic keratosis can be used in cases where tone, texture, and specific macules need to be addressed. In more severe cases of photoaging, IPL combined with an ablative fractional laser can simultaneously address superficial cell turnover along with dermal neocollagenesis.

When using IPL devices off the face, it is necessary to lower the fluence 5% to 10% compared with facial settings to avoid untoward edema or blistering. In addition, caution is advised if the returning patient has been in the sun and has even mildly tanned skin, because the same settings may result in a burn.

Lasers

The use of laser and light therapies are widespread for hand rejuvenation, but because the dorsal hand skin is thinner than that of other anatomic areas, the parameters have to be adjusted to lower fluence and number of passes, to reduce the risk of adverse effects and recovery time. Solar lentigines and macular seborrheic keratoses can be removed with 1 to 2 treatments with QS ruby laser (694 nm), QS alexandrite laser (755 nm), or the frequency-doubled QS Nd:YAG laser (532 nm).¹⁶ In a randomized controlled study comparing the efficacy of 3 lasers and liquid nitrogen for solar lentigines in the back of the hands, a 1-time treatment with the frequency-doubled QS Nd:YAG laser was the most effective at selectively destroying melanin while preserving surrounding tissue.¹⁷ Another study of 11 patients demonstrated that the QS ruby laser was superior to the ablative CO₂ fractional laser in the treatment of solar lentigines on the dorsum of hands.¹⁸ Depending on the skin type, a longer wavelength is more suitable to prevent undesirable side effects such as hypopigmentation, such as 1,064-nm QS Nd:YAG. Superficial vascular lesions such as telangiectasias have also been successfully and safely treated with long-pulsed Nd:YAG laser.¹⁹ Finally, picosecond 755 and 1,064 nm are now avail-

able and may prove to be more effective for lentigines. A recent study has demonstrated the efficacy of the 755 nm picosecond pulsed alexandrite laser with diffractive lens array for rejuvenation of the photodamaged décolletage, but no studies have examined their specific effect on lentigines on the hands.²⁰

Dermal Rejuvenation—Increasing Remodeling

Nonablative Lasers

Nonablative lasers with wavelengths in the mid-infrared range penetrate into the deep dermis and by inducing thermal injury, stimulate neocollagenesis, evoke a wound-healing response, whereas surface cooling mechanisms spar the epidermis and minimize recovery times. There are limited reports for the use of nonfractional lasers for hand treatment, although a study using the 1,320-nm Nd:YAG laser for hand rejuvenation in 7 patients treated 6 times in 4-week intervals showed mild to moderate improvement in skin smoothness compared with baseline at the six-month follow-up visit.²¹

The introduction of fractional lasers in 2003, led to their widespread adoption since delivering laser energy in microthermal treatment zones, permits rapid epidermal repair by the surrounding tissue, thus minimizing adverse effects and prolonged recovery times (Figure 1). A prospective study using an ablative fractional CO₂ laser in 10 participants, receiving 3 treatments to 1 hand at 4- to 6-week intervals showed a high degree of improvement with



Figure 1. Hand rejuvenation using fractional laser.

no long-term sequelae.²² From a multitude of fractional nonablative lasers, the 1,550-nm erbium-doped and 1,927-nm thulium laser is commonly used for the rejuvenation of dorsal hand skin. In the author's experience, the 1,927-nm wavelength is preferred when targeting diffuse pigment, whereas the 1,550-nm wavelength is used when attempting to improve skin texture and appearance by stimulating collagen production. When using the fractionated 1,927-nm thulium laser, 8 passes with fluences of 10 to 20 mJ are used and 1 treatment is typically necessary. All Fitzpatrick skin types are treated with 40% coverage. When using the 1,550-nm wavelength with the 15-mm handpiece and air-cooling, 8 passes with fluences of 30 to 35 mJ are used. Fluences may be adjusted upward to 40 to 45 mJ, depending on the patient's response from previous treatment. Fitzpatrick skin Types I to III are treated with 28% coverage, whereas skin Types IV to VI with 20% coverage. Three successive treatments at 4-week intervals are recommended. A consensus panel made specific recommendations for the second-generation 1,550-nm erbium-doped laser when treating the skin of the dorsal hand (Table 1).²³ In the authors experience, when combining the 1,550- or 1,927-nm laser after pretreatment with a QS or a picosecond laser (e.g., for targeting individual lentiginos), the energy densities are lowered to reduce potential side effects.

Radiofrequency

Radiofrequency (RF) energy is a noninvasive technology that can increase dermal remodeling independent of skin type. By emitting energy that heats the tissue, collagen is immediately denatured and the process of neocollagenesis is stimulated without disrupting the epidermis. Radiofrequency is associated with few complications and adverse effects while allowing a quick recovery time.²³ Although lacking

significant clinical studies, treatment of aging hands with RF can improve aesthetic appearance of the dorsal surface of the hands by reducing skin laxity and increasing dermal collagen. In a prospective, multicenter study using a monopolar RF device for moderate to severe hand wrinkles, 31 patients receiving 3 RF treatments at 2-week interval showed 50% improvement from baseline with no adverse effects. For the treatment, the RF device (4.0 MHz, 120 W) with a 20-mm handpiece was set at a level of energy based on the verbal feedback about tip warmth from the patient. The handpiece was moved in continuous overlapping corkscrew patterns to completely cover each of the 3 gel-coated treatment zones, and when the skin surface temperature of the treated area reached 40°C to 42°C, the treatment was continued for an additional 3 minutes. The sequence was repeated again for a total of 2 passes in each zone.²⁴ Based on the author's clinical experience, the use of the latest RF technologies including the nanofractional RF device (Viva; Venus, Toronto, Canada) and the multigenerator RF with nanofractional microneedling handpiece (Intensif; Endymed, New York, NY) can be used successfully to improve skin laxity of the dorsum of the hand.

Biologics

Although the field is still in its infancy, promising results in rejuvenating the dermal layer and improving the signs of age in the hand are expected to be found using injectable biologics, such as growth factors, platelet-rich factors, and stem cell extracts. By engaging directly with protein receptors in the dermal layer, stimulation of neocollagenesis and inhibition of cellular degradation can rejuvenate the hand from the inside out.²⁵

Vein Removal

After successful volume restoration, vein removal is often unnecessary. In cases where bulging or prominent veins persist and cause patient distress, use of sclerotherapy or endovenous vascular ablation can be appropriate (Figure 2).¹⁰ A retrospective study evaluating the safety and efficacy of 0.25% to 1% sodium tetradecyl sulfate foam sclerotherapy for reticular veins of the dorsal hands showed it as a safe and effective treatment with excellent long-term patient satisfaction.²⁶ In

TABLE 1. Consensus Recommendations for 1,550-nm Erbium-Doped Laser

<i>Skin Type</i>	<i>Type I–III</i>	<i>Type IV–VI</i>
Fluence	10–40 mJ	
Passes	8	
Treatment level	7–11	4–7



Figure 2. Sclerotherapy treatment of hand veins.

the author's experience, the use of foam sclerotherapy with 0.5% sodium tetradecyl sulfate or 1% polidocanol results in a near 100% success rate with 1 treatment. Compression gloves are not necessary, although some practitioners recommend their use for a minimum of 2 weeks after foam sclerotherapy to ensure an excellent cosmetic outcome. In 1 author's office, hands are wrapped with an ACE bandage for 24 hours. Patients are told to expect 2 weeks of mild to moderate swelling. The use of endovenous ablative laser therapy for unwanted veins has been reported in a clinical study with favorable patient outcomes (Figures 3 and 4). Using a 940-nm diode laser, 28 patients were treated in the office setting, and a compressive dressing was used postoperatively. All 28 patients were satisfied with their results during in the 31-month follow-up.²⁷

Restoring Lost Volume in Hands

Volume restoration in the hands has been successful achieved by a variety of soft tissue fillers. By reconstituting the subcutis with a tissue stimulant such as poly-L-lactic acid (PLLA), or simply replacing the volume with a filler such as autologous fat, hyaluronic acid (HA) or calcium hydroxylapatite (CaHa) plumping of the hands, tissue laxity and reduction of vascular and bony prominences can be achieved (Table 2).

Autologous Fat

The location for donor sites is usually determined by where the patient has available fat that may result in cosmetic benefit from reduction in that area.



Figure 3. Endovenous laser ablation of hand veins before treatment.

Although initial studies have not shown any evidence of a favorable donor site for the harvest of fat grafts, adipose tissue has recently been identified as a source of processed lipoaspirate cells or adipose-derived stem cells (ADSCs).^{28,29} Hence, fat grafts may also improve the quality of aged and scarred skin apart from their volumetric effect. Evaluation of processed lipoaspirate cells from the lower abdomen and inner thigh demonstrated higher concentrations of adult ADSCs compared with other common donor sites, thus these may serve as better donor sites.³⁰ It remains to be shown, however, that stem cells are beneficial in fat transfer.³¹ In 1 small 6-patient study for lipoatrophy, no added benefit was seen in the cell-assisted transfer.³² The procedure involves harvesting fat followed by injection into the hand where the fat performs like a graft and establishes its own blood supply.¹⁰ Multiple techniques on harvesting, preparing fat for injections have been described and results can vary from 4 months to 3 years. In 1 study, 19 of 21 patients reported high degree of satisfaction at the 2-year follow-up after fat grafting of their hand.³³ In the authors' experience, centrifuged fat is preferred,

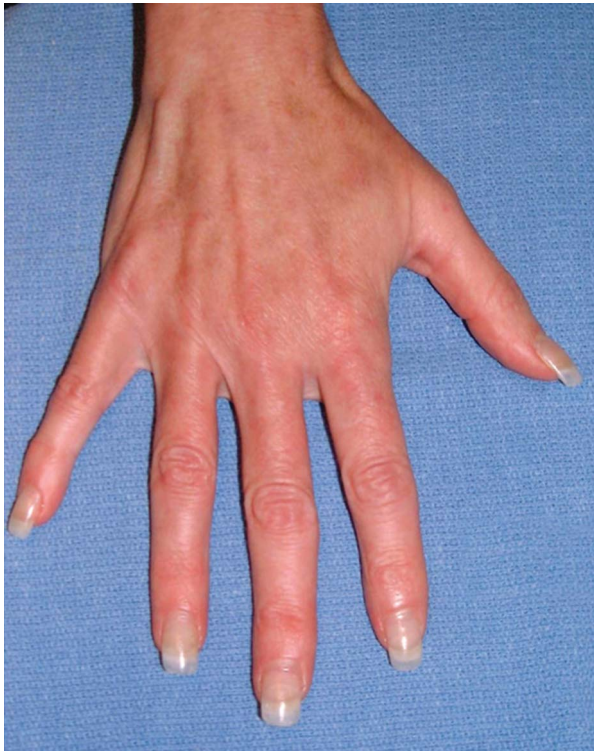


Figure 4. Endovenous laser ablation of hand veins 3 months after treatment.

and demonstrates better longevity and better results (Figure 5).³⁴

Hyaluronic Acid

The use of HA for hand rejuvenation has demonstrated favorable results that can persist between 6 and 18 months. Hyaluronic acid can both immediately replace volume but also stimulate production of collagen, as reported by a recent study where mesotherapy with HA effectively improved skin aging and photoaging, supported by quantifiable ultrasound data showing significant changes in skin density over time. In this study, 22 subject received multiple

microinjections of HA salts of biotechnological origin on the dorsum of 1 hand, and saline on the other, once weekly for 4 weeks, and successively, once monthly for 4 or 9 months. At the 10-month time point, a significant increase of subepidermal thickness was observed, as evaluated with high-intensity focused ultrasound.³⁵ In another study with 99 patients enrolled, hands were injected with Juvéderm Ultra at the first visit, and Juvéderm Hydrate 2 weeks later. A final assessment was made at Day 30. Both the investigators and the patients reported a significant aesthetic improvement.³⁶ However, these agents are not currently available in the United States. Another study looked at long-term effectiveness of small gel particle (SGP)-HA for the hands in 16 patients. SGP-HA (20 mg/mL) was administered in a single injection into the dorsum of the hand using a threading technique. The injected material (4.0 mL per hand) was then massaged. Immediately after injection, the material was massaged using an antibruising cream (Auriderm clearing gel, Biopelle, Ferndale, MI), and melting ice was briefly applied. Patients had the option of a touch-up (maximum volume 1.0 mL/hand) 2 weeks later. Improvements were largely maintained at 6 months with 85% patient satisfaction. At 1 year, assessments approached pretreatment levels, but 50% patient satisfaction was still noted. No Tyndell effect was noted.³⁷

Calcium Hydroxylapatite

Calcium hydroxylapatite is a biocompatible filler studied for hand rejuvenation for the past decade. Length of correction can last up to 2 years and there is low risk of adverse events.¹⁰ Several publications have reported successful volume restoration of the hand with CaHA in more than 100 patients with varying

TABLE 2. Injectable Fillers for Hand Rejuvenation

<i>Fillers</i>	<i>Products</i>	<i>Techniques</i>	<i>Durability, mo</i>
PLLA	Sculptra	25–26-gauge needle tunneling/threading, massage	18–24
CaHa	Radiesse	22–25-gauge cannula or 26–28-gauge needle tenting technique, massage	12–15
HA	Voluma, Restylane, Juvéderm	27–30-gauge needle, tunneling/tenting or droplets, massage	6–12
Autologous fat	Autologous	18-gauge cannula, withdrawing technique	4–12



Figure 5. Centrifuged fat on patient's left versus noncentrifuged fat on patient's right at 1-year follow-up.

techniques and dilutions of lidocaine.^{38,39} In the author's experience, injections of 1.3 mL of CaHa in dorsal hands of 10 patients showed high-patient satisfaction at the 1-year follow-up with limited self-resolving side effects (Figures 6 and 7). Some physicians mix lidocaine with the product before administration with added volumes ranging from 0.2 to 1.0 mL of lidocaine, depending on skin thickness in the hand. Others deploy a bolus of lidocaine, followed by injection of CaHA.^{40,41} For this study, the authors elected to use numbing cream (benzocaine, lidocaine, and tetracaine) rather than injection of lidocaine proper, followed by a period of 45 minutes to an hour

before administration of CaHA.³⁹ The most common adverse effect noted is postinjection swelling that can last up to 2 weeks. Aside from application of ice, triamcinolone lotion can reduce discomfort. Patients are also given postfiller instructions to follow for the first 48 hours: elevate their hands when not active, apply ice 2 or 3 times per day, and avoid strenuous or rapid hand movements.

A study of 20 patients is currently underway examining the potential benefit of injecting 5 ccs per hand of triamcinolone 2 mg/mL immediately after the CaHA injections. Early results suggest much less swelling



Figure 6. Hand dorsum before injection of 1.3 mL of CaHa.



Figure 7. Hand dorsum 3 months after injection of 1.3 mL of CaHa.

with this protocol, although results regarding duration of product are pending (Goldman and coworkers, San Diego, CA). Calcium hydroxylapatite received Food and Drug Administration approval in 2015 for hand augmentation. In 1 author's experience and in discussion at filler demonstrations with experienced injectors, some patients who use their hands frequently for work or exercise may have prolonged swelling after CaHA injections. For these patients, injecting 1 half syringe (0.75 mL) per hand has shown minimal swelling and high patient satisfaction. Treatment may be repeated in 2 to 4 weeks for full correction and low morbidity.

Poly-L-lactic acid

Poly-L-lactic acid is a biocompatible, semipermanent soft tissue filler that induces neocollagenesis by fibroblasts. Poly-L-lactic acid can be successfully used in the hand in a dilute preparation to avoid the formation of nodules or papules. Specifically, diluted preparations with 7 mL of diluent per PLLA bottle and ensuring massage during treatment followed by daily hand massage for 1-month posttreatment can minimize any adverse effects.⁴² Several treatments may be required and, in contrast to other products, a waiting period is necessary to determine whether full correction has been achieved that can last up to 2 years (Figure 8). In a case series of 26 patients treated with PLLA for hand rejuvenation, each vial of PLLA was reconstituted on

the night before the procedure to a volume of 10 mL: 6 mL of sterile water for injection and 1% lidocaine to provide a more dilute preparation. One half vial was injected per hand, with five 1-mL syringes per side into the immediate subdermal plane using a 25-gauge 1.5-inch needle. Patients were advised to massage for 5 minutes at a time, 5 times a day for 5 days, and then once a day for an additional month. An average of 2.38 treatments was administered per patient, with an average of 3.06 vials per patient. Two to 3 treatments were recommended for all patients, at 1-month to 2-month intervals and most of the patients pursued treatment until they were satisfied with results.⁴² Another retrospective review of patients treated with PLLA in the hands concluded a high degree of satisfaction with the results, with only minor and short-term injection-related adverse events.¹⁰ Others have noted an increased risk of nodularity for the thin skin of the hands.⁴³ With this in mind, 1 author uses precautions such as very dilute solutions (16 mL or more), longer intervals between injection sessions (8 weeks), and vigorous massage regularly for 1 or more weeks.

Same-Day Treatment Combinations for Hand Rejuvenation

Rejuvenation for the multiple visible signs of aging in the hands (such as photoaging, actinic and seborrheic keratosis, fat and muscular atrophy, and vein prominence) is ideally performed in a careful multistaged



Figure 8. Three months after injection of PLLA in left hand only.

fashion, ideally a week apart, but more often on the same day, beginning with the epidermal and dermal treatments, followed by filling in the subcuticular plane if needed.⁴⁴ Concern over the potential of lasers

or RF to degrade the injected filler deterred some physicians to administer energy-based devices before volumizing the hand. However, a small study in 36 patients demonstrated that RF, laser, or IPL may be

TABLE 3. Options for Same-Day Combination Treatments

<i>Indication</i>	<i>Combination 1</i>	<i>Combination 2</i>	<i>Combination 3</i>
Pigmentation, vascular lesions mild photoaging	1. IPL 2. QS or picosecond laser	1. IPL 2. 1,550-nm fractional laser	1. QS or picosecond laser 2. 1,550-nm fractional laser
Pigmentation, mild to moderate actinic keratosis	1. ALA × 60 min 2. Vbeam to AKs 3. IPL for full face 4. Red and/or blue light	1. ALA × 90 min 2. Steps 2–4 3. If response incomplete, proceed to combination 3	1. Imiquimod qhs × 1–2 wks before 2. ALA 90 min under occlusion 3. Repeat next steps
Dyschromia skin laxity	1. IPL 2. CaHA/PLLA	1. IPL 2. Nanofractional RF	1. QS or picosecond laser 2. CaHA/PLLA
Dyschromia skin laxity (mild/moderate) volume loss	1. IPL 2. Nanofractional RF 3. CaHA/PLLA	1. Q-switch or picosecond laser 2. Nanofractional RF 3. CaHA/PLLA	1. IPL 2. 1,550 nm 3. CaHA/PLLA
Dyschromia skin laxity (severe) volume loss	1. 1,927 nm 2. Nanofractional RF 3. CaHA/PLLA	1. Nanofractional RF 2. IPL 3. CaHA/PLLA	1. Ablative fractional laser 2. IPL 3. CaHA/PLLA
Bulging veins	Sclerotherapy: not to be combined with any other aesthetic treatment		

applied after filler injections.^{45,46} Reports from another clinical study indicated that subjects receiving concomitant RF with volumetric filler injection experienced increased short-term tenderness compared with patients receiving the treatments as monotherapy.⁴⁷ Although there is currently no clinical evidence demonstrating higher rates of side effects in patients receiving combination treatment versus single therapies, it is good clinical practice to ensure that patients are informed about all possible side effects associated with each treatment and that appropriate steps are taken to minimize any such effects.⁴⁴

It is recognized that the advent of new treatment devices with enhanced efficacy and reduced patient discomfort, together with the fact that patients are increasingly busy and seek so-called “lunch-time” procedures with minimal downtime has actuated physicians to develop same-day hand rejuvenation regimens. Despite the paucity of the scientific literature in evaluating such “same-day” therapeutic regimens in terms of safety and efficacy, the authors acknowledge that from their personal clinical experience and patient feedback, there are multiple options to rejuvenate the hand in 1 office visit. With the exception of sclerotherapy that excludes the possibility of combination with another treatment because of the preoperative and postoperative care, a number of options are available to combat multiple indications depending on patient indications and physicians experience with specific devices. Table 3 summarizes the options of same-day in-office procedures for hand rejuvenation.

Conclusions

Rejuvenating the aging hand is a multimodal approach, where all 3 layers of the skin are individually evaluated and sequentially treated to restore the tone, the texture and finally the volume that leads to the optimal aesthetic result. For example, if a sequence is chosen that includes an IPL treatment for lentiginosities, followed by RF for laxity and then revolumization, the patient should be examined at each step to make sure that healing is adequate and that the desired results have been achieved before proceeding further. In the case of protruding bulging veins being an urgent cosmetic complaint, it is advised that sclerotherapy pre-

cede the subsequent treatments during the design of the procedural regime. Maintenance of the clinical results can be ensured with regular follow-up visits and integration of an at-home skin care program. The use of sunscreen is paramount to protect and prevent hands from photoaging. An am/pm strategy with daily use of a cream or serum containing antioxidants and the nightly use of a low-strength retinoid can help maintain the quality of the epidermis while continuing the stimulation of collagen synthesis. A combinational approach can without doubt ensure a revitalized aesthetic outcome of the hands, regardless of the skin type, or the severity of the aging effects. Successful safe hand rejuvenation is best achieved with a combination approach.

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