

Editorial

Newer trends in facial rejuvenation

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Visual appraisal of facial youthfulness holds a place in the heart of all humans. Increased life expectancy, financial affluence and peer pressure, fueled by written media, TV shows, radio, and celebrity endorsement, all have set facial rejuvenation in vogue. Statistics show a consistent rise in the number of patients undergoing different procedures to restore their youthful appearance. From 1997 to 2007, surgical cosmetic procedures increased by 114% and nonsurgical by 754% in USA.¹

In 1990s, lasers supplanted dermabrasion and deep chemical peels as treatment of choice for general facial resurfacing, especially for photodamage, wrinkles and atrophic scarring. Ablative lasers like CO₂ and erbium:YAG work by disrupting the entire epidermis by photoablation which is followed by regeneration of the epidermis and new collagen synthesis. No doubt the lasers produce long lasting clinical results after a single session, eliminate epidermal lesions, have predictable outcomes and induce greater skin tightening. Ablative lasers need effective anesthesia and intensive postoperative care and are associated with slow healing, prolonged downtime and the risk of scarring and dyspigmentation, particularly in darker skin types.

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Box 1

Nonablative lasers and light sources for facial rejuvenation

- Lasers (erbium glass laser [1540nm], erbium doped fiber laser [1550nm], diode laser [1420nm], long-pulsed Nd:YAG [1320nm, 1064nm], Q-switched Nd:YAG, flashlamp pulsed dye laser [585nm] etc.)⁴
- Intense pulsed light (500-1200nm)
- Light emitting diodes
- Infrared light
- Radiofrequency

Ablative lasers and light sources for facial resurfacing

- Fractional CO₂ and Er:YAG laser
- Plasma skin regeneration
- Fractional micro-plasma radiofrequency

Dermal fillers

- Hyaluronic acid fillers
- Poly-L-lactic acid
- Autologous fat

Phosphatidylcholine

Botulinum toxins

Autologous platelet rich plasma

All these factors paved the way for the new nonablative lasers and other light sources that provide optimal results with minimal side effects. The introduction of less invasive procedures has increased acceptance of such procedures which are quicker and simpler and that do not divert patients from their daily routine and activities for prolonged periods. Hence, they can be recommended for ethnic skin.

Today, the dermatologists have many options in their armamentarium (**Box 1**) to rejuvenate the aging skin. These include dermal fillers, botulinum toxins, lasers and light sources and other techniques to help

their aging clients. Combining more than one procedure may show even better results. The underlying concepts and mechanisms of some of these technologies are known and hypothesized in others.

Fractional photothermolysis is a novel nonablative laser technique for facial rejuvenation which produces a distinctive thermal damage model characterized by multiple columns of thermal damage, known as microthermal treatment zones (MTZs), 50-70µm wide, surrounded by untreated tissue. The untreated tissue serves a reservoir for rapid healing after treatment. This results in lesser side effects and enhanced efficacy.⁴ Fractional lasers are also used for treatment of melasma and acne scars.

Long-pulsed and Q-switched 1064nm lasers target melanin as well as hemoglobin and water. There is supporting evidence of improvement with a Q-switched 1064nm laser for nonablative treatment in type IV skin.⁵

Apart from the light and laser based devices, various other newly developed non ablative techniques have been used for treatment of skin type IV and VI, including light emitting diode, radiofrequency, infrared tightening and plasma skin regeneration technology.⁶

Light emitting diodes are amongst the latest advancement in visible light spectrum for photoaged skin. This device is thought to act by targeted stimulation of fibroblastic mitochondrial metabolic activity and, thereby, raising the pH, activating cyclic adenosine monophosphate (cAMP), and increasing DNA/RNA synthesis., concomitant upregulation of procollagen and downregulation of matrix metalloproteinase.⁷

Radiofrequency (RF) is an electromagnetic radiation in the frequency range of 3kHz to 300GHz which causes dermal heating and destruction of collagen. The process of wound healing leads to remodeling of collagen and wound contraction with subsequent improvement in skin laxity.⁸ It is a chromophore-independent mechanism with little chances of pigmentary changes. RF appears to be a promising means of photorejuvenation in ethnic skin.

A new device called titan uses infrared (IR) light to heat the dermis. By heating the water in dermis, it induces collagen contraction, subsequent collagen remodeling and new collagen synthesis. The epidermis is protected with cooling. Improvements in skin laxity and facial and neck contours have been achieved with this device and this procedure is also efficacious in darker skin types.⁴

Plasma skin regeneration (PSR) technique uses ionized nitrogen gas, plasma, as source of energy which is delivered in a millisecond pulse to skin upon contact without reliance on skin chromophores. It can be used at varying energies for different depths of effect, from superficial epidermal sloughing to deeper dermal heating. With the Portrait® PSR device (Rhytec, Inc.) there are five treatment guidelines/protocols termed PSR1, PSR2, PSR3, PSR4 (PSR2/PSR3) and PSR5. All protocols improve fine lines, textural irregularities, and dyspigmentation; however, skin tightening is probably more pronounced with the high-energy treatments (PSR3 and 4).⁹

Some researchers have used local injections of phosphatidylcholine or sodium deoxycholate to reduce small areas of localized or unwanted facial fat like jowls and chins. These supposedly cause fat cell lysis.³

Although different studies have demonstrated low risk and efficacy of using such technology in all skin types, the effectiveness of some of these still remains to be established. These procedures in darker skin are challenging but they can be used successfully if certain guidelines are followed. It is essential to discuss the risks and patients' expectations before any laser procedure especially in darker skins as availability of wide range of these novel gadgets for rejuvenation can easily be misleading.

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