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Lasers for facial rejuvenation: a review

Evangelia Papadavid, MD , and Andreas Katsambas, MD

From the Dermatology Department A. Syggros Hospital, Athens, Greece

Correspondence Evangelia Papadavid, MD Leoforos Alexandras 213B Athens 11523 Greece E-mail: epapad@otenet.gr

Abstract

Background Different types of laser are used for resurfacing and collagen remodeling in cutaneous laser surgery.

Methods A systematic review was performed of the different types of laser currently employed for skin rejuvenation. These systems are either ablative [high-energy pulsed or scanned carbon dioxide (CO₂) laser emitting at a wavelength of 10,600 nm, single- or variable-pulse or dual ablative/coagulative mode erbium:yttrium aluminum garnet (Er:YAG) laser emitting at a wavelength of 2940 nm, or systems combining both 10,600 nm and 2940 nm wavelengths] or nonablative [Q-switched neodymium:yttrium aluminum garnet (Nd:YAG) laser emitting at a wavelength of 1064 nm, Nd:YAG laser emitting at a wavelength of 1320 nm, or diode laser emitting at a wavelength of 1450 nm]. Different protocols, patient selection, treatment techniques, and complications are discussed for each system.

Results New-generation CO₂ resurfacing lasers have been successful in the treatment of photodamaged skin and scarring, with a postoperative morbidity dependent on the depth of thermal damage. Because of its minimal penetration, the pulsed Er:YAG laser, usually used in the treatment of more superficial rhytides, produces less postoperative morbidity. Novel ablative systems have been developed and a further understanding of laser–tissue interaction has led to the design of nonablative systems for the treatment of rhytides, scarring, and photodamaged skin, the efficacy and profile of which remain to be evaluated in the long term.

Conclusions There are several effective techniques for scar revision and the treatment of aged skin, but all have their drawbacks due to a lack of precise depth control and unwanted damage to the lower layers of the dermis. The Er:YAG laser is the treatment of choice for fine lines and superficial scars, whereas the CO₂ laser is better for deeper rhytides and scars. In the future, a combination of lasers may be used for facial rejuvenation.

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