

Dermatologic Surgery Into the Next Millennium, IV

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The use of lasers for facial resurfacing and tattoo removal is discussed with special emphasis on patient safety and avoidance of complications. In addition, hair transplantation and development of new techniques over the past 3 decades are detailed. Long-term planning of hair transplant sessions is of foremost importance for the patient to achieve the most natural-looking hairline.

In the previous issue (*Cutis*. 2001;68:193-195), we discussed new developments in face-lift procedures and blepharoplasties. In this article, we focus on using lasers for skin resurfacing and tattoo removal, as well as for hair transplantation.

Laser Resurfacing

Since the development of the principle of photothermolysis, the use of lasers in the cosmetic surgery office has increased dramatically and their applications have expanded rapidly. Technical developments are producing new laser devices with different chromophore spectra and thus different indications for use. The pulsed CO₂ laser and erbium:YAG (Er:YAG) laser are available for facial resurfacing. The Er:YAG laser is indicated for mild-to-moderate rhytides and does not induce a long-lasting posttreatment erythema compared with the CO₂ laser.¹

The CO₂ laser is still our mainstay for facial resurfacing. The treatment results for moderate-to-deep rhytides are excellent. In addition, the side effect profile for Er:YAG and CO₂ lasers is similar. Potential side effects such as postinflammatory hyperpigmentation, infections (bacterial, viral, yeast), and scarring are rare and can be addressed appropriately during

close postoperative patient follow-up. In addition, the laser resurfacing procedure easily can be combined with other cosmetic interventions such as microfat injection, blepharoplasty, and mini-face-lift. At our practice, we use the CO₂ laser for both scar revision and acne scar treatment. In some cases, CO₂ laser resurfacing precluded the need for blepharoplasty because of its contraction effect.²

Tattoo Removal

Tattoo removal is performed with a variety of lasers that are chosen according to the color of the tattoo. The treatment duration, however, is not predictable. Thus, patients should understand that tattoo removal will take more than one session. Our treatment rate varies between 4 and 8 sessions. The major advantages of tattoo removal with lasers include a low risk of scarring and no blood loss.³ The pulsed-dye laser is used for the treatment of red tattoos, port-wine stains, telangiectasis, striae distensae, verrucae, and hypertrophic scars.⁴ These laser procedures are well tolerated by the patient. Although treatment with the pulsed-dye laser is associated with initial bruising, our experience has shown that it is more efficient than other laser systems used for similar indications.

The rapid progression of laser system techniques has led to their use for new indications including treatment of leg veins and hair removal. Laser beams can attack a specific chromophore and precisely limit the depth of tissue injury and tissue damage. It is foreseeable that these laser systems will be packaged in devices that are more handy than those currently available. There are already available laser systems with the properties of 2 lasers in one, as well as different laser systems in the same hardware.

Hair Transplantation

The technique of hair transplantation has undergone significant advancements since the first

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patients were treated in the late 1970s. Initially, the transplantation was performed using 4-mm punch plugs. The result was a granular or "pluggy" look. The desire to achieve a more natural look resulted in the replacement of the punch graft technique with minigrafts and micrografts, which now are the standard transplant grafts.^{5,6}

Hair transplant surgery now involves excising multiple donor stripes from the occipital area and cutting them into minigrafts and micrografts. Our office procedure calls for the use of sharp microdilators to create recipient sites into which the transplants are carefully placed one by one. This is a tedious and time-consuming procedure.⁷⁻⁹ In our experience, however, the cosmetic results are excellent and the hairline created appears natural.

The tumescent anesthesia technique is a patient friendly procedure that has a decreased pain sensation and decreased risk of blood loss. Although there is a trend toward mega hair transplant sessions, we prefer to limit our transplant sessions to 600 grafts at a time. We have found sessions of this length to be more accommodating for the patient, as well as our nursing staff. Also, these additional hair transplant sessions add volume and density to the patient's hair.

We envision the procedure of hair transplantation becoming automated or semiautomatic. Computers with laser knives could cut the grafts after scanning each micrograft or minigraft. With the help of a device similar to the computerized pattern generator being used in the laser field, microdilators and hair grafts could be placed equidistant automatically. Although this development might not be encountered in the near future because of the fragility of the micrografts and the required perfection in handling technique, it is not science fiction. What's more, the medical treatment approach for hair loss through gene therapy is already on the way. Ahmad et al¹⁰ recently discovered the first human hair-loss gene.

In summary, cosmetic dermatologic surgery covers a variety of procedures for rejuvenation and body shaping. Our experience has shown these procedures to have a high safety profile. We see a tendency toward less-invasive procedures that do not require a prolonged downtime for the patient. The trend away

from in-patient operations to the out-patient setting will continue. In addition, a combination of multiple procedures and techniques will optimize the expected results.¹¹⁻¹³ New technologies and newly acquired knowledge about basic science issues such as fat metabolism signaling and wound healing will help us to attain our goal of overall patient safety, well-being, and satisfaction.

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A chip inserted into the brain reads off electrical signals that are translated by a computer to restore some movement and communication. Couple it with an exoskeleton, and magic will truly happen: lately, it made headlines that a 30-year-old paralyzed man, Thibault, was able to move all four of his limbs with the help of a "mind-reading" exoskeleton. Read The Medical Futurist's guide to understanding, anticipating and controlling artificial intelligence. Start Reading Now. 4) 3D printing drugs in dinosaur shapes for kids. If guns, bars of chocolate, even entire houses can be 3D printed now, and the biotechnology industry is even working on printing out living cells; why would the appearance of 3D printed drugs be surprising? It's a logical sequel that's already happening.

Private dermatologic surgery and laser practice. A total of 150 patients, with skin types I through V, were treated with long-pulsed KTP 532-nm and long-pulsed Nd:YAG 1064-nm lasers, separately and combined. For the KTP 532-nm laser, the fluences varied between 7 to 15 J/cm² at 7- to 20-millisecond pulse durations with a 2-mm handpiece and 6 to 15 J/cm² at 30- to 50-millisecond pulses with a 4-mm handpiece. The 1064-nm Nd:YAG laser fluences were set at 24 to 30 J/cm² for a 10-mm handpiece. [Show full abstract]

androgenetic alopecia had hair replacement surgery with the recipient sites divided into four quadrants comparing cold stell, erbium, combined erbium low-power CO₂, and combined erbium high-power CO₂ technologies. Dermatologic cosmetic surgery is a subspecialty of dermatology that has recently been developed. In this four-part series, we describe many of the procedures performed in our ambulatory surgery setting. We also highlight the significant changes in the techniques and treatment environments for these procedures over the past three decades. In part one, we focus on liposuction and face lift operations. Patients increasingly expect less invasive procedures, decreased "down time," and superior results. These expectations create a greater demand for the dermatologic surgeon. The trends and prospects for dermatologic cosmetic surgery in the next millennium are illustrated. Dermatologic surgery into the next millennium, IV. Ingrid P. Warmuth, Dwight A. Scarborough, Emil Bisaccia. Dermatologic surgery into the next millennium, part II. Ingrid P. Warmuth, Robert S. Bader, Dwight A. Scarborough, Emil Bisaccia. Dermatologic surgery into the next millennium, part II. Ingrid P. Warmuth, Robert S. Bader, Dwight A. Scarborough, Emil Bisaccia. Dermatologic surgery into the next millennium, part II. Ingrid P. Warmuth, Robert S. Bader, Dwight A. Scarborough, Emil Bisaccia. N/A. The majority of dermatologic surgery falls into this category. The infection rate of these wounds is less than 5%. Of note, this incidence is based on general surgery cases, which are often of longer duration and a greater extent than most dermatologic procedures. This explains the lower actual infection rate in dermatologic surgery, which is in the 1%–3% range. 2. Clean-contaminated wounds (class II) are created on contaminated skin or any mucosal or moist intertriginous surface, such as the oral cavity, upper respiratory tract, axilla, or perineum. Infected wounds (class IV) have contaminated foreign bodies, purulent discharge, or devitalized tissue. Examples included necrotic tumors, ruptured cysts, or active hidradenitis suppurativa. These wounds have an infection rate of 40%.