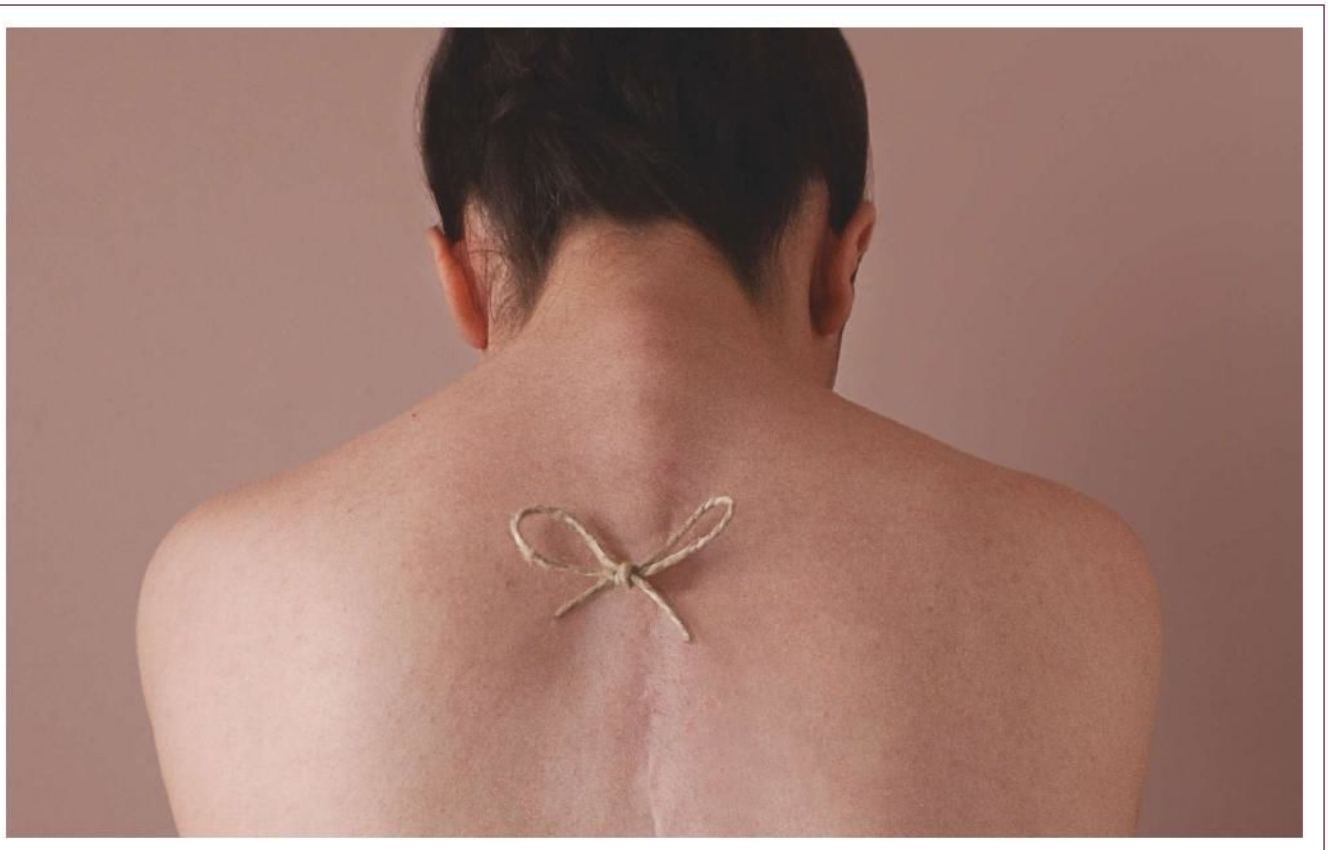

Scar Revision

By Daniel Casciato

An overview of surgical and nonsurgical solutions for hypertrophic and keloid scars.

I ALWAYS SAW BETTER WHEN MY EYES WERE CLOSED © GETTY IMAGES

SCARS ARE INEVITABLE when the skin is cut. But the types of scars that bring patients to a plastic surgeon's office vary widely. You may see traumatic scars, burn scars or surgical scars that have become widened, raised, hyperpigmented or hypervascular. In some of the most difficult cases, patients may experience keloid scars that continue to grow and disfigure.

"There is a difference between a hypertrophic scar and a keloid," says Babak Dadvand, MD, of Beverly Hills, California-based Dr. Dadvand Plastic Surgery. "People tend to refer to all raised scars as keloids, when in fact most of them are hypertrophic scars. The key difference is that although both types are raised, hypertrophic scars maintain the same shape as the original incision, whereas keloids can have a completely different shape and size than the original incision. For example, keloids of the earlobe after piercing can look like little golf balls."

Dr. Babak Dadvand performed surgical resection of this patient's keloid scarring. He injected kenalog prior to closure. One month after surgery, she began using a silicone and methylprednisolone scar cream and received a second kenalog injection to halt new tissue growth.

Whether your patient is struggling with extensive traumatic scarring, a poorly healed hypertrophic surgical scar, or keloid scarring, there are a variety of surgical and nonsurgical treatment options available.

"The one thing I tell patients regarding scar treatment is to be patient," says Dr. Dadvand. "Time is on your side. Most scars tend to improve with time, and even when adding different scar therapies to Mother Nature, it's important to let both the therapy and time do their thing."

The type of scar, its location and its appearance will help guide treatment. Skin type and patient ethnicity also play key roles in determining the best tools to alleviate unsightly scars. Patients of Asian, Hispanic and Middle Eastern descent may be more prone to hyperpigmentation. African Americans may be at higher risk of keloids due to genetic predisposition.

Surgical Scar Revision

In many cases, you can help patients shed unappealing surgical scars and painful reminders of traumatic injuries with a single surgical procedure. In these cases, no-tension, meticulous closure is essential to healing, says Edwin F. Williams III, MD, FACS, president of the American Academy of Facial Plastic and Reconstructive Surgery (AAFPRS) and managing partner of Williams Center Plastic Surgery Specialists in Latham, New York.

In an effort to avoid tension that can cause additional hypertrophy or atrophy with widening of the scar, he cuts out the existing scar and uses a layered suturing technique to close the wound. Following surgery, it takes a year for the scar to fully mature.

If the scar occurs on the scalp or in the eyebrows, it can be especially noticeable due to the loss of hair growth in the area of scar tissue. For these cases, John Kahen, MD, founder of Beverly Hills Hair Restoration in Beverly Hills, California, uses follicular unit extraction (FUE), to extract hair follicles from the scalp and then transplant them into the scarred areas to conceal the scar tissue.

Nonsurgical Scar Treatments

Laser treatments and intralesional injections are the most widely used nonsurgical techniques to improve the appearance of scarring. Ibrahim Khansa, MD, et al, published "Evidence-Based Scar Management," a comprehensive review of keloid, traumatic and surgical scar revision techniques in *Plastic and Reconstructive Surgery* (September 2016 Supplement). They reviewed more than 40 studies to provide evidence-based guidelines.

In split-scar studies, pulsed dye lasers (PDL) and CO_2 lasers were the most effective devices for established hypertrophic scars. The PDL reduces pruritus and erythema; CO_2 improves scar pliability. If only one laser is used, PDL—which targets the microvasculature of the scar—was found to be the most effective overall, but its shallow penetration (1mm) limits its ability to reach the depth needed to release scar tissue. The authors note that combing PDL with CO_2,

PHOTOS COURTESY OF BABAK DADVAND, MD

intralesional steroids or 5-fluorouracil (5-FU) has been shown to improve outcomes.

Bruce Katz, MD, a board certified dermatologist and founder of Juva Skin & Laser Center in New York City, uses PDL to reduce erythema and flatten raised scars as well as a fractional CO_2 to reduce scar tissue and stimulate new collagen.

This patient underwent roughly 10 PDL treatments over a 12-month period to repair an upper lip defect following skin cancer resection. After surgery, she used a silicone- and sunscreen-based lotion daily with strict sun avoidance.

He stresses that the ideal time to begin treatment is six to eight weeks after the scar has developed. "The common misconception, even among doctors, is to wait a year until the scar matures," says Dr. Katz. "However studies have shown that the earlier you treat scars, the more effective the treatment."

Dr. Khansa, et al, found that PDL treatment offers the best results in immature hypertrophic scars (less than one year old) that are still hypervascular and erythematous. As the scar matures, treatment becomes less effective and patients require more sessions to achieve improvement.

Dr. Katz notes that the number of laser sessions needed is highly variable—ranging from two to as many as 10. "It all depends on how thick the scar is, how long it has been there and how raised it is," he says. "On average, it takes four to six treatments."

Intense pulsed light (IPL) is also effective at reducing erythema and hypervascularity. "We observe patients during the first three months, and if we see any over-healing or overzealous scars, we'll inject a steroid directly into the scar and use IPL every three to four weeks," says Dr. Williams.

Keloid scars are the most challenging cases to treat. Dr. Khansa, et al, noted that multimodal treatment—combining surgical or CO_2 laser-assisted excision with intralesional injections of steroid, mitomycin C or bleomycin, plus PDL, silicone compression and, in some cases, radiation—is often required to reduce the keloid and prevent recurrence.

Treatment at the Time of Surgery

There is mixed evidence for treatments delivered at the time of surgery to reduce hypertrophic scarring. Richard M. Goldfarb, MD, FACS, founder of the Center for SmartLipo & Plastic Surgery in Langhorne, Pennsylvania, injects Selphyl (Factor Medical) directly into the wound at the time of the closure. "We've gotten great results with this," he says. The concept is based largely on evidence showing that growth factors in platelet-rich plasma (PRP) help induce healing in chronic diabetic ulcers. In September 2011, Marissa J. Carter, PhD, et al, published a review study of PRP for wound healing in *ePlasty*. After reviewing 24 eligible studies, they concluded that PRP improved complete and partial wound healing compared to control wound care.

When reviewing five studies on the use of PDL delivered at the time of suture removal, Dr. Khansa, et al, found two studies showing that treatment improved erythema, scar pliability and overall appearance compared to the untreated side of the scar. But three additional studies showed no long-term improvement between treated and untreated areas.

Currently, there is no treatment that will completely eliminate scarring, but physicians can help patients achieve significant improvement. "Scars do not typically go away completely but raised scars will flatten and red scars will go back to regular skin color," says Dr. Katz.

Good postoperative follow-up care can be your best tool for halting the growth of hypervascularized and hypertrophic scars. Dr. Goldfarb has his surgical patients come in two weeks, six weeks, three months and six months after their procedures to monitor their wound healing. "You want to constantly monitor the scar area because if you let a poorly healing scar go three to six months without care, it will continue to thicken and become more difficult to treat," he says. ME

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