HOT AESTHETIC TRENDS IN 2013

Topical eye products, tattoo removal, lasers for onychomycosis, and microcannulas for injectable fillers are just a sampling of the trends that will continue to shape the practice of aesthetics in the year ahead.

BY JULIE WOODWARD, MD, ARIELLE N.B. KAUVAR, MD, NAZANIN SAEDI, MD, AND KIAN KARIMI, MD

The field of medical aesthetics continues to evolve. Looking into 2013, we can expect that the aesthetic market will continue to grow as newer procedures are unveiled that offer consistent demand. Ahead, Julie Woodward, MD, Chief of Oculofacial Surgery at Duke University Medical Center; Arielle N.B. Kauvar, MD, Director of New York Laser & Skin Care in New York and Clinical Professor of Dermatology at the New York University School of Medicine; Nazanin Saedi, MD, Assistant Professor at Thomas Jefferson University in Philadelphia; and Kian Karimi, MD of Pacific Eye and Ear Specialists and Pacific Cosmetic Surgeons in Los Angeles, examine current and forthcoming trends.

TOPICAL EYE PRODUCTS —WHAT REALLY WORKS?

By Julie Woodward, MD

When it comes to eye cosmeceuticals, there are many excellent yet diverse technologies available today. First, it is important to understand the etiology of under-eye dark circles. There are six basic issues that contribute to this annoying entity: shadow, hollow, translucent skin, superficial dermal pigment, deep dermal pigment and hemosiderin, and rhytids.

Prolapsed orbital fat (steatoblepharon) will cast dark shadows on the inferior orbital rim. As we age, we lose tissue along the inferior orbital rim that presents with a hollow area that looks dark. Also, our lower eyelid skin becomes so thin that it is translucent, allowing us to see through to the vascular dark orbicularis muscle beneath. Laser resurfacing can thicken this skin by producing more opaque collagen. Some patients with darker Fitzpatrick skin levels are more prone to harbor deep dermal pigment that can be very difficult to treat. This deep pigment may be due to melanin or hemoglobin bloodstaining from longstanding vascular stasis. More superficial pigments such as lentigos are more amenable to improvement with topical products. Finally, rhytids are caused by wrinkling in both the skin and the orbicularis muscle, which creates a multitude of dark shadows. Rhytids can improve with laser resurfacing, neuromodulators, or skin/muscle redraping. Festoons are a separate problem than the under-eye dark circles and are another entire conversation. These are challenging and may require a combination of fillers, redraping, and laser to improve.

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There is scarce quality research on topical eye products and their efficacy. A search on PubMed for peer-reviewed, indexed articles only discovered seven articles within the past five years. In general, however, we can discuss five basic groups of cosmeceuticals for the skin that can be used around the eyes:

- Antioxidants,
- Retinoids,
- Growth factors,
- Peptides, and
- Chemical peels.

Many products' package inserts state not to use them around the eyes, for example, tretinoin. However, this

well-known topical agent has long been a popular treatment for periocular rhytids.

My personal favorites include topical antioxidants, which have abundant research to demonstrate the ability to prevent damage to skin from oxidative stress, whether that be from light, pollution, or poor diet. I have used the Skin Ceuticals CE Ferulic on my face and under my eyes nearly every day for the past 13 years. Only when vitamins C and E and ferulic acid are formulated with a proper acidic pH can they enter the skin, and it takes application for three to four days to reach a peak level. Twice-daily application does not speed attainment of this level, so only once per day application is necessary. One beauty of the product is that it maintains this level for three to four days after the product is stopped, so if you forget to bring it on a weekend trip, it continues protecting the skin. Drug store formulations of vitamins C and E will not enter the skin due to lack of proper acidic formulation. Many companies have tried to emulate the antioxidant photoprotection of CE Ferulic, but only a couple have even come close.

EMERGING RESEARCH

New research shows that skin is not only damaged from UVA and UVB rays, but also from visible light and infrared light or electromagnetic radiation.

New research is showing that our skin is not only damaged from UVA and UVB rays, but also from visible light and infrared light. Sunscreens do not block these rays, but antioxidants can offer some protection. Studies show that after assault from electromagnetic radiation, skin treated with antioxidants has less sunburn erythema, less cells entering apoptosis death, less thymine dimer formatation (cancer marker), less MMP-9 induction (linked to photoaging), and an increase of Langerhahns cells for protective immunity.

Growth factors such as those in Skin Medica and Neocutis products have shown the ability to produce some improvement. Human growth factors are controversial because of their potential ability to induce skin cancers. I believe that these have an excellent role in post-laser healing. As an alternative, I like Renewnt because it doesn't contain growth factors. It works via the Wnt signaling pathway to modulate stem cell differentiation not proliferation.

CAUSES OF UNDER-EYE DARK CIRCLES

Shadow

Hollow

Translucent skin

Superficial dermal pigment

Deep dermal pigment and hemosiderin

Rhytids

Deep dermal pigment can be a stubborn problem. This can be due to melanin migrating downward into the deeper dermis, and hemosiderin. Hydroquinone 4% has been a standard of care, but its side effects have caused it to be banned in various countries and in Texas. At Duke, in ophthalmology research it is injected into animal models to induce macular degeneration. Other topicals that may be beneficial for under-eye pigment are Elure and Lumixyl.

Elure is a mild topical bleach for use twice daily. It is a very safe product derived from lignin peroxidase tree fungus, *Phanerochaete chrysosporium*. This fungus was originally used to bleach wood white to make paper. Studies with the colorimeter are showing promise that it decreases melanin even within the first week of application. This product works well in concert with a tyrosinase blocker.

Lumixyl Revitaleyes has a new eye cream lightener also for use twice daily. It addresses hyperpigmentation with decapaptide 12 that is supposedly more potent for blockage of tyrosinase than hydroquinone, but without the risks of onchronosis or cancer. Not only does this product block tyrosinase, but it also cheleates iron deposits, as it addresses inflammation and dry wrinkles with a variety of other ingredients.

Chemical peels are also known to improve under-eye appearance. The new Gloss dual-treatment eye area by Skinluma has a two-vial treatment system, where the peel is applied only on certain days of the week. I look forward to learning more about this new system along with many upcoming technologies.

THE INS AND OUTS OF TATTOO REMOVAL

By Arielle N.B. Kauvar, MD

Tattooing is an age-old practice dating back to the fourth to fifth century BC. Since the 1990s, decorative and cosmetic tattoos have become a fashion statement in Western culture, with recent studies showing that as many as 40 percent of young Americans sport one or more tattoos. There are several types of tattoos: decorative tattoos that are usually applied professionally and may be comprised of multiple colors; traumatic tattoos that result from asphalt impregnation with road injuries, pencil lead, or gunpowder; cosmetic tattoos that are also known as "permanent

makeup;" and medicinal tattoos for radiation treatments.

As many as 20 to 50 percent of the tattooed population are dissatisfied with their tattoos, but only six percent seek removal, most likely because tattoo removal is a long and expensive process. Lasers can safely remove tattoos without changing the natural skin pigmentation and without scarring, but as many as five to 15 sessions may be required, depending on the ink composition, and a period of four to eight weeks is required between sessions.

Laser light is absorbed by the tattoo ink, which is broken up into smaller particles, is then engulfed by phagocytes and then deposited in draining lymph nodes. Drawbacks to current methods are the lack of specific laser wavelengths to efficiently break up all color inks. Additionally, some inks have titanium dioxides and iron oxides and when treated, idiosyncratic ink darkening can occur as a result of a reduction in oxidation state of the molecule and produces a black precipitate.

EMERGING RESEARCH

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Several new approaches are now being taken in an effort to speed up the tattoo removal process. A multiple-pass technique with the same or different wavelengths produces faster lightening of the tattoo (i.e., fewer treatment sessions). Fractional ablative lasers, which vaporize microscopic bits of skin, are being used alone (in the case of allergic tattoos) or in conjunction with Q-switched lasers for resistant inks. Newer, picosecond lasers can break up smaller ink particles than the conventional nanosecond lasers and are capable of removing dark inks in fewer treatment sessions.

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Melasma is another common problem that, until recently, has remained difficult to treat. Conventional treatments with topical hydroquinone and other bleaching creams have limited value, and treatment with high-power pigment lasers, resurfacing, and fractional lasers can result in rebound melasma, hyperpigmentation, and hypopigmentation. A new technique I developed (published in *Lasers Surg Med.* February 2012) combines microdermabrasion with a Q-switched YAG laser, used at very low fluences. In a study of 27 subjects with resistant melasma, the mean clearance score was greater than 75 percent after an average of 2.6 treatments. Most subjects had visible lightening after just one treatment session. This procedure is painless, has no risk of side effects, and can be safely used in all skin types. Long-term remissions were achieved in some subjects for greater than one year.

LASERS FOR TREATING ONYCHOMYCOSIS

By Nazanin Saedi, MD

Onychomycosis is difficult to treat. Topical agents are not very effective because they cannot penetrate the nail to reach the affected nail bed. The oral antifungals can be effective but have the potential to cause systemic side effects. Laser treatment of onychomycosis has garnered increasing attention due to its efficacy without the potential side effects or requisite laboratory monitoring for systemic anti-fungal treatment.

The Q-switched 1064nm Nd:YAG and 532nm KTP lasers have been shown in vitro to effectively inhibit the growth of *Trichophyton rubrum*, the most common cause of dermatophytosis in the world and the cause of 80 percent of onychomycosis in the US. However, clinically there are no studies that demonstrate their efficacy.

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The carbon dioxide laser (CO_2), 870/930nm dual-wavelength laser, 1064nm Nd:YAG lasers, and photodynamic therapy (PDT) have all demonstrated clinical success; however, there are no randomized, controlled trials to validate

the findings. The most accepted theory is that the effectiveness of laser treatment of onychomycosis is thought to be due to nonspecific thermal damage. The most commonly used modalities are PDT and the Nd:YAG laser. PDT can be effective because of the conversion of 5-ALA to protoporphyrin IX by fungi and yeast. Protophorphyrin IX possesses peak wavelength absorption between 630 and 700nm, making it easily targeted by red light. There have been two case reports and a clinical trial that have found PDT to be effective, but it is more time consuming than the other devices.

The Nd:YAG laser is commonly used to treat onychomycosis. It is thought that possibly since the Nd:YAG laser (1064nn) has a longer wavelength, it can penetrate deeper tissue and efficiently target fungal overgrowth in the nail bed. In the studies using the Nd:YAG laser, patients received two to three treatments spaced three to four weeks apart using a sub-millisecond pulse duration. The patients had 51 to 87 percent clearance based on negative cultures.

Onychomycosis affects many patients, and using lasers offers a way to treat the condition. Lasers are relatively noninvasive treatments and continue to be widely used for treating onychomycosis. However, there is a need for further research investigating the cure for onychomycosis.

SPEAKING BLUNTLY: MICROCANNULAS FOR INJECTABLE FILLERS

By Kian Karimi, MD

The microcannula is the future of injectable filler treatments. This fact has been echoed by many world experts including facial plastic surgeons, general plastic surgeons, oculoplastic surgeons, and dermatologists. The medical literature also supports this position, with studies demonstrating that there is less bruising and pain when using the microcannula. A recent review in *Plastic and Reconstructive Surgery* recommends using microcannulas for injectable fillers to minimize and essentially eliminate the risk of complications such as blindness, stroke, or necrosis.[1]

THE PATIENT EXPERIENCE

Patients that have had injections with the traditional techniques and have now switched to having fillers performed with the microcannula are the strongest advocates of their use. They appreciate the ease of receiving the injections without any blocks or topical anesthetic. They uniformly report little to no pain during the injections (even in traditionally painful areas such as around the eyes or the lips), no bruising, and far less swelling. This was recently demonstrated in a double-blind, randomized and controlled clinical trial.[2]

I have found that once patients understand how the microcannula works, they agree that it is a superior way of having their injectable fillers performed. We have found that no more or less filler needs to be used when performing these procedures as has been reported on some online blogs.

CRITICISM OF THE CANNULA

We estimate that only five percent of injectors nationwide are using the blunt cannula, which drives one to ask: "So what is the hold up?" Why are so few physicians using the cannula in this country? The answer, I believe, is lack of awareness and fear of the unknown. I have heard many criticisms of the cannula, citing cost (about $5 per cannula), increased length of time needed to perform the injections, the need to use more filler to achieve results similar to those with a sharp needle, lack of accuracy, increased risk of infection, and even increased risk of injury to vessels and soft tissue.

> "Using the cannula, filler injections are more accurate, since it is a dynamic process instead of just putting in a needle and pushing filler in and trying to massage it into place."

ModernAesthetics.TV

See a demonstration of the microcannula technique at ModernAesthetics.com. Click on the videos tab and search for "microcannula."

BOTTOM LINE

Current and emerging treatment options address common aesthetic concerns that have no seasonal course, or they improve treatment outcomes, leading to happier patients and consistent demand.

The excellent results achieved with the microcannula and the peace of mind for the injector when performing treatments of high-risk areas are worth the cost of using the cannula. When using the blunt cannula, I have not found that it takes more filler to perform augmentation of different treatment areas. I also do not believe that it takes less filler than traditional techniques to achieve augmentation of different areas. Using the cannula, I have found my filler injections are more accurate, since it is a dynamic process instead of just putting in a needle and pushing filler in and trying to massage it into place.

With regards to infection, I too have often worried about the fact that a foreign object is inserting in and out of the face and contacting surrounding skin while this is occurring. I address this by prepping the skin in a broad area and constantly wiping the cannula with an alcohol pad when I remove it from the soft tissues to assess results. With regards to safety, there is no doubt that using the microcannula is safer than using the sharp needle in high-risk areas.[1,2]

WHAT WILL THE FUTURE HOLD?

As awareness of the cannula increases around the country and worldwide, I foresee a shift in the standard of care from sharp needles to blunt cannulas. Every day when I perform injectable fillers and see the results I am able to achieve without bruising, hurting the patient, or the fear of injecting into a vessel or vital structure, my appreciation of the cannula increases. My use of the microcannula has expanded to perform nasal augmentation (liquid rhinoplasties), injecting intralesional steroids, platelet rich plasma (PRP), and fat grafting for filling around the eyes. ■

In addition to having an active practice in otolaryngology and facial plastic surgery in Los Angeles, Dr. Karimi is Medical Director of DermaSculpt Inc., which markets microcannulas.

1. Lazzeri D, Agostini T, Figus M, et al. Blindness following cosmetic injections of the face. Plastic & Reconstructive Surgery 2012;129(4):995-1012

2. Hexsel D, Soirefmann M, Porto M, et al. Double-blind, randomized, controlled clinical trial to compare safety and efficacy of a metallic cannula with that of a standard needle for soft tissue augmentation of the nasolabial fold. Dermatologic Surgery 2012;38(2):207-214