The Interface of Cosmetic Medicine and Surgery: Working from the Inside and the Outside

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KEYWORDS

• Cosmetic surgery • Minimally invasive • Plastic surgery

The role of noninvasive procedures as part of a thriving practice is a significant concern according to a panel on practice trends presented at The Aesthetic Meeting 2008, the annual meeting of the American Society for Aesthetic Plastic Surgery (ASAPS).[1] Two surveys[2] conducted in 2007 under the auspices of a Cosmetic Medicine Task Force formed as a joint venture between ASAPS and American Society of Plastic Surgeons (ASPS) examined consumers' attitudes and perceptions influencing their choice of plastic surgery procedures and the variety of cosmetic services offered in plastic surgery practices. Minimally invasive or noninvasive procedures, including laser and light therapies, injectables, and dermal fillers, now account for 80% of cosmetic procedures. According to the 2009 ASPS statistics, the top 5 minimally invasive procedures in 2009 were

1. BOTOX (Allergan Inc, Irvine, CA, USA) injections (4.8 million)
2. Soft tissue fillers (1.7 million)
3. Chemical peel (1.1 million)
4. Microdermabrasion (910,000)
5. Laser hair removal (893,000).

Most consumers viewed surgical procedures as high risk, but perceived virtually no risk associated with noninvasive or minimally invasive procedures. Despite their popularity, these procedures still comprise a small part of most plastic surgeons' practices; the survey found that for 91% of surgeons, noninvasive treatments generated less than 25% of their revenue.

Plastic surgeons should remain educated and current on noninvasive or minimally invasive cosmetic surgery procedures. Patients who undergo these procedures will only develop further trust and allow the surgeon the opportunity to offer a more comprehensive set of therapeutic options. This will, in turn provide continuity of care and facilitate a successful practice.

This article provides a basic overview of the common noninvasive and minimally invasive therapies in cosmetic surgery, some areas being discussed in more detail than others. Skin care products and skin types are discussed first.

TOPICAL SKIN CARE

The modern skin care industry continues to evolve rapidly with an almost unlimited array of skin care

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products available. Many products are categorized based on particular skin types. There are 4 parameters for characterizing facial skin types

1. Dry or oily
2. Sensitive or resistant
3. Pigmented or nonpigmented
4. Wrinkled or tight.

These 4 parameters can yield 16 different combinations, each with different skin care needs. Furthermore, each skin type may change over time in the individual (because of intrinsic or environmental causes) and thus change the subsequent management.[3]

Dry or Oily

The role of the stratum corneum (SC) is the most significant factor in the development of dry skin. In patients with dry skin the lipid bilayer of the SC is disturbed, increasing fatty acid levels and reducing ceramide layers.[4] Various extrinsic factors, including UV radiation, detergents, acetone, chlorine, and protracted water exposure or immersion, can disrupt the lipid bilayer. The maintenance of water within skin cells depends on natural moisturizing factor. Aquaporin-3 allows water transfer between the keratinocytes. Sebum, the oily secretion of the sebaceous glands, that contains wax esters, sterol esters, cholesterol, triglycerides, and squalene imparts an oily aspect to the skin and plays a significant role in acne development.[5] In normal skin, sebaceous gland–derived triglycerides are hydrolyzed to glycerol before transport to the skin surface. In sebum-deficient individuals, replacing this glycerol may be a suitable approach to alleviating skin dryness. There are numerous over-the-counter moisturizers available to help hydrate the skin, including occlusives, humectants, and emollients. Occlusives are typically oily compounds that coat the SC to impede transepidermal water loss (TEWL). Many occlusives also impart an emollient effect and are suited for treating dry skin. Examples of occlusives include petrolatum, lanolin, and propylene glycol. None of them impart long-term effects. Once the occlusives are removed from the skin, the TEWL returns to the previous level. Occlusives are usually combined with humectant ingredients because reducing the TEWL by more than 40% can increase the risk of skin maceration and subsequent bacterial infection.[6] Humectants are water soluble and can attract water from the external environment, in conditions with at least 80% humidity, as well as from the underlying skin layers. In low-humidity conditions, however, humectants may take water from the deeper epidermis and dermis, thereby increasing the TEWL. They are thus more effective in combination with occlusives. By drawing water into the skin, humectants may cause minor swelling of the SC and yield a perception of smoother skin with fewer wrinkles. Humectant ingredients include glycerin, urea, hydroxyl acids, and lactic acid. Emollients are primarily composed of lipids and oils and are added to cosmetics to hydrate, soften, and smooth the skin. These compounds fill in the gaps between desquamating corneocytes to render a smooth surface.[7] In short, occlusives coat the SC and reduce the TEWL, humectants attract water from the outer atmosphere and hydrate the skin, and emollients soften and smooth the skin. While several expensive moisturizers contain collagen that manufacturers contend can replace the collagen lost due to aging, most of the collagen extracts have a molecular weight of 15,000 to 50,000 Da. Only substances with a molecular weight of 5000 Da or less can penetrate the SC.[6] The collagen and polypeptides in these products create a film that fills in surface irregularities but only temporarily stretches out fine skin wrinkles.

Sensitive or Resistant Skin

People with resistant skin rarely experience erythema and can use a variety of products without any significant concern for adverse reactions. However, many products are limited in their penetration of resistant skin and thus ineffective. Sensitive skin is more complex and has 4 discrete subtypes (acne, rosacea, stinging, and allergic), all sharing one common element inflammation. Patients may present with more than one subtype. Features of the acne subtype include the adherence of dead keratinocytes in the hair follicles because of elevated sebum production, clogging of the follicle, and production of a papule or pustule. Bacteria migrate into the hair follicle and trigger an inflammatory cascade. Treatment focuses on the 4 primary causal factors (1) decreasing sebum production with retinoids, oral contraceptives, or stress reduction; (2) unclogging pores with retinoids and α-hydroxy acids; (3) eliminating bacteria with antibiotics and topical care; (4) and reducing inflammation. The rosacea subtype includes prominent telangiectasias, in addition to common adolescent symptoms of facial redness, flushing, and papules. Topical treatment focuses on antiinflammatory ingredients to decrease vasodilation. The stinging subtype involves a nonallergic neural sensitivity to certain triggers. People with such a subtype should avoid topical products including those containing