



Editorial

Esthetics in eye

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Beauty lies in the beautiful eyes of the beholder, something that scientists have begun to question. An individual's identity is formed by the alignment of eyes, mouth, and nose, which are gaze targets.

One of the oldest ophthalmological conditions known to occur in humans is strabismus, which affects an individual's overall appearance. Strabismus is indirectly associated with poor quality of life. An individual, who interacts with someone with strabismus, may have varied opinions on the subject's personality traits. Considering these aspects, surgical correction of strabismus has gained importance as it modifies perception. Although surgical correction has been the mainstay of the management of strabismus, recently, agents such as ADAL-1, fibrin glue, hyaluronate, mitomycin C, daunorubicin, and ADCON-L are being investigated as surgical adjuvants.

The popularity and variety of temporary and permanent periocular esthetic treatments have increased over the past decade. Patients frequently present to eye clinics with ocular complications and side effects following these treatments, their severity ranging from ocular irritation from dry eyes to visual loss from vascular occlusion. A thorough history is essential, as many patients may not associate esthetic procedures with ocular complications, and some may be embarrassed to disclose this information. All ophthalmologists should understand the potential ocular sequelae of these treatments and be able to initiate therapy in sight-threatening cases.

People of all cultures have used cosmetics since prehistoric times to highlight eyes to enhance beauty and attractiveness. Over 60% of women in the USA report regular use of eyeliner and mascara. Kohl, an eyeliner commonly used in Asia and the Middle East, may cause heavy metal toxicity and pigment migration to the conjunctiva and lacrimal system. Despite rigorous safety assessments in the USA and Europe, these cosmetics may affect the ocular surface through several mechanisms. Migration of cosmetics from the periocular skin and eyelid margin onto the ocular surface is the leading cause of cosmetic-associated ocular surface disease, causing blockage of Meibomian glands and destabilization of the tear film lipid layer, and predisposing to evaporative dry eye disease. An integrated ocular surface disease mindset that identifies and treats the dermatologic (D), esthetic (A), and ophthalmologic (O) aspects of ocular surface disease elevates your care from just seeing better to the DAO trifecta of feel better, look better, and see better.

The use of cosmetics contaminated with microbes may induce ocular surface inflammation. Periocular cosmetics and eye makeup removers contain various chemicals including fragrances, preservatives, antioxidants, emollients, resins, nickel-containing pigments, and pearlescent additives. Any of these chemicals may induce allergic contact dermatitis and allergic conjunctivitis leading to ocular inflammation and tear film instability. Preservatives in periocular cosmetics

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including chlorhexidine, thimerosal, benzalkonium chloride, and formaldehyde have been demonstrated to have a toxic effect on corneal epithelial, conjunctival epithelial, and Meibomian gland cells.

Periocular cosmetics have been linked to lacrimal disorders including primary acquired nasolacrimal duct obstructions with reports of cosmetic pigment clumping the lacrimal system. Mascara-laden casts within the canaliculus (dacryomascarolith) cause physical obstructions to the lacrimal drainage system. Other cosmetic pigments including kohl, contain heavy metals such as lead, silver, carbon, and iron, which may provoke an inflammatory response.

Hypertrichosis is a side effect of topical prostaglandin analogs used in glaucoma treatment. Lash ptosis and trichiasis also occur. Long, thick, and dark eyelashes are regarded as a beauty asset in most cultures, and prostaglandin eyelash serums have become increasingly popular as a cosmetic aid. Following the success of bimatoprost eyelash serum, prostaglandin serum has also been used for eyebrow hypotrichosis.

Eyelash and eyebrow tints and dyes are a popular cosmetic treatment saving time and money on mascara and eyebrow pencils. The main complication of eyelash and eyebrow dye is an allergy to one or more constituents. The most common allergen in eyelash dye is p-phenylenediamine. Corneal argyria (silver deposition in the Descemet membrane layer) may develop in patients who self-apply eyelash dyes containing aqueous silver lactate.

False eyelashes and extensions can give the appearance of longer, thicker eyelashes saving time and money on mascara. The primary reported complication of false eyelashes and eyelash extensions is contact dermatitis and delayed hypersensitivity reaction to the glue used for eyelash application, which sometime leads to accidental gluing of eyelids.

Eyeliner tattoos are a popular option for people, who wish to save time and money on conventional eyeliner and for those, who have disabilities preventing makeup application.

Cosmetic tattooing can also be used to enhance the appearance of eyebrows, mainly when eyebrow hair are deficient or light in color, replicating the effect of eyebrow pencils.

Complications of eyelid and eyebrow tattooing may be related to injection technique, effects of the procedure on ocular adnexal structures, and the ocular surface or allergy to components of the tattoo ink. Pigment fanning beyond its intended location is a common complication of eyelid and eyebrow tattoos. Several reports of cutaneous and systemic sarcoidosis present as a granulomatous disease within eyelid and eyebrow tattoos including one with associated intermediate uveitis. Cosmetic tattoos often contain heavy

metals, and several reports of magnetic resonance imaging artifacts are in the region of the tattoo.

Facial aging is an ongoing biological process governed by both intrinsic and extrinsic factors. Conventionally, surgical treatments remained superior for decades due to satisfactory outcomes. More affordable, less invasive procedures have replaced expensive and invasive esthetic surgical procedures. For the past few years, novel non-surgical treatment modalities have increased due to less patient morbidity and faster recovery.

Facelift is a procedure that improves visible signs of aging in the face and neck. Conventional facelift surgeries are effective in most cases but have significant patient morbidity. Over some time, minimally invasive to non-invasive procedures have become more popular than traditional surgical treatment options. With the advent of neurotoxin and facial fillers, there is a paradigm shift in cosmetic therapies. Other recent nonsurgical modalities include Ultherapy, intense pulsed light (most commonly targets wrinkles in the perioral and periorbital regions. Superficial lines respond well than deep furrows), laser lift (most frequently used lasers are fractional CO₂ laser therapy and erbium laser therapy), radiofrequency skin tightening (obtain skin tightening by immediate collagen contraction with a single treatment), and plasma skin tightening (plasma, the fourth state of matter in which electrons are stripped from atoms to form an ionized gas, used for skin rejuvenation). Non-surgical treatments are ideal for mild-to-moderate facial aging and are superior to surgical interventions in terms of post-operative morbidity and faster recovery in such cases. Multiple therapies are usually required for sustained desirable results.

The most common non-surgical cosmetic facial procedures are botulinum toxin injections, which have historical ties to the field of ophthalmology. Developed by an ophthalmologist, it was devised for treating strabismus and blepharospasm. The use of botulinum toxin for facial enhancement is the most common cosmetic procedure globally. Botulinum toxin treats dynamic and static rhytids in the periocular region, primarily furrows arising from contraction of the frontalis, corrugator supercell, glabellar muscles, and lateral canthal "crows' feet." It has also been used to target brow depressors to reposition the brow and avoid the requirement for a surgical brow lift. The side effects and complications of botulinum toxin arise primarily from use in a medical setting, specifically to treat facial dystonia and periocular synkinesis secondary to facial nerve palsy. No data in the literature specifically on the side effects of botulinum toxin administered for esthetic purposes. Spread of botulinum toxin beyond the target region is the leading cause of side effects and complications. Dry eye disease induced by botulinum toxin depends on the injection site and may result from incomplete blink, reduced aqueous tear production or Meibomian gland dysfunction

with tear film instability. Spread of botulinum toxin to the lacrimal gland disrupts parasympathetic innervation of the lacrimal gland and directly affects tear production resulting in aqueous deficiency. Lacrimal gland botulinum toxin injections are a well-established treatment for crocodile tears after facial nerve palsy.

Acetyl hexapeptide (Argireline) is a synthetic peptide developed as a topical version of botulinum toxin. It acts as a competitive SNAP-25 inhibitor inhibiting the release of acetylcholine at the neuromuscular junction and temporarily paralyzing superficial facial muscles. Although evidence is limited, Argireline may be considered a safer, if less effective, treatment option for periorbital rhytids.

Materials injected within or beneath the skin to improve its physical appearance by soft-tissue augmentation are known as fillers. An ideal filler material should be safe, biocompatible, resistant to infection, non-teratogenic, non-carcinogenic, and non-allergic. It should fix to the surrounding tissue and maintain the desired facial contour. Dermal fillers are increasingly used in the periocular region as part of facial rejuvenation to compensate for loss of periocular volume in the aging face. A wide variety of dermal filler formulations are used in the periocular region. Hyaluronic acid-based fillers are the most popular temporary fillers, as they have a good safety profile and the advantage of being reversible if required using hyaluronidase. Permanent and semi-permanent fillers, for example, calcium hydroxylapatite and polyacrylamide, have longevity advantages with fewer treatments required.

Immediate and early onset complications of fillers are injection site reactions, early hypersensitivity reactions, acute infection (present with swelling, erythema, pustules, and abscesses at the site of injection), nerve damage (due to partial or complete transection of the nerve by the injection needle or by nerve compression due to local edema), contour irregularities and changes in skin color, vascular occlusion, and skin necrosis (the most feared complication), and retinal artery occlusion (recognized by visual loss with or without pain often occurs within seconds of injection and may be associated with headache, nausea, and vomiting and neurological symptoms and signs, the most common injection sites that led to this complication were the glabella [38.8%], nasal region [25.5%], nasolabial fold [13.3%], and forehead [12.2%]). Late-onset complications are delayed hypersensitivity reactions (may present weeks or months after injection, with symptoms of edema, granulomas, panniculitis, and rarely systemic granulomatous and autoimmune disease), chronic infection (late-onset inflammatory nodules), skin color changes (telangiectasia and hyperpigmentation), and malar edema (due to impairment of lymphatic flow).

Beauty lies in the eyes of the beholder;

The face is the index of the mind;

Ophthalmology plays a significant role in bringing life to famous quotes like these.

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