

EYE TATTOOING, A FACIAL EXTRA PACK, AND ENHANCED BEAUTY

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Abstract

This article explores the history of various techniques that have been used to improve the aesthetic look of the eye, with associated risks, and it has evolved further recently.

It focuses on its perceived importance, motivations, and potential health implications. This topic has recently gained increasing attention and trend, particularly within younger populations who view such procedures as forms of self-expression and aesthetic enhancement.

The article highlights the cosmetic appeal of scleral tattooing, often linked to individuality, identity and social influence. However, despite its visual impact, eye tattooing carries significant medical and ethical concerns. The procedure involves injecting pigment into the sclera, which can result in serious complications such as inflammation, infection, chronic pain, photophobia, and even permanent vision loss. Given the lack of medical regulation and professional oversight in many cases, these risks are especially pronounced in younger individuals who may not fully understand the long-term consequences.

By exploring both the aesthetic motivations and the medical dangers, the aim is to promote awareness, encourage responsible decision-making, and support the need for public education and stricter safety regulations regarding cosmetic ocular procedures.

Eye or cornea tattooing, also known as keratopigmentation (KTP), is a cosmetic procedure designed to alter eye colour permanently. It can be considered a discipline within cosmetic dermatology, as, according to those choosing the procedure, it enhances facial beautification, boosts confidence, and refines external beauty, focusing mainly on improving the aesthetic balance of the

face, which is pursued with a range of procedures, such as fillers, Botox, and chemical peels.

Originally, eye tattooing was used for medical purposes to treat corneal opacities and visual defects. KTP has gained popularity for purely aesthetic reasons. Techniques range from traditional needle-based methods to advanced femtosecond laser-assisted approaches, which are more precise but still carry risks.

Reported side effects of keratopigmentation range from minor issues, such as light sensitivity or localized infection, to more severe problems, including pigment displacement, corneal injury, and, in rare cases, permanent vision impairment. The newer trend, "Lumineyes," utilizes a laser to depigment brown eyes, revealing the underlying blue tones. However, this can block eye drainage, causing glaucoma and blindness.

Historically, altering eye colour has been explored through drops, implants, and lasers—none of which are risk-free or widely approved. Silicone iris implants, for instance, have caused severe harm and have been banned in several countries. Despite their aesthetic appeal, especially under the influence of social media, most eye health professionals strongly warn against such procedures. The long-term safety of eye tattooing remains unknown, particularly in young patients who may later develop complications such as undetected eye diseases or challenges with surgeries like cataract removal.

Ultimately, tattooing the eyes for cosmetic purposes is not recommended. It risks damaging the eye's natural function and obscuring future diagnoses—all for the sake of an unnatural, often idealised appearance.

Keywords: Eye tattooing, eye colouring, eye lasering, eye pigments

Introduction

Keratopigmentation, also known as corneal tattooing, is a surgical procedure used mainly in blind and disfigured eyes when surgical correction is not suitable, by depositing pigments in the corneal stroma, to boost self-esteem, acceptance and confidence. It was considered to be safe and efficacious (1,6,7).

Eye tattooing is quite an intimidating term, as the mantra with any tattoo implies a skin, not the eyes themselves. So, how did all this come along, and what exactly is it implying? Eye tattooing is also known as Laser your eyeballs or Lumineyes, and all doesn't come cheap. However, there have been various efforts to change eye colour for solely cosmetic reasons (1).

Many humans are not satisfied with their personal presentation, and we witness this everywhere, starting with body contouring, tummy tucks, buttock and breast augmentation, lip fillers, and faces constructed by Botox. Recently, this has extended to changing eye colour for merely cosmetic reasons, and permanently, with whatever science brings, without applying logical thinking, beyond the immediate artifice. So, what is this trend we are witnessing nowadays.

The whole story seems to have started with patients suffering from disfiguring corneal opacities, to whom Keratopigmentation (KTP) was applied to mitigate and improve them. KTP is corneal tattooing that has been used for cosmetic management of corneal opacities for centuries, and it's not a new thing (1).

Cornea facts:

- Damage to the cornea can result in scarring, loss of clarity, and reduction in vision.
- The cornea has the highest density of nerve endings of any tissue in the whole body, which acts as a protective mechanism.
- Loss of cornea sensitivity results in increased risks of trauma and poorer healing responses.
- Corneal burns can be caused by chemicals, acids or alkali; however, the latter are far more severe. Also, thermal burns, heat, and light (flash burns), including UV light, can be detrimental.

The practice of altering the cornea with pigments is not new; records from antiquity describe it was used to hide corneal scars. By the 5th century, Aetius and others experimented with staining techniques involving natural substances (1-2). Interest declined for centuries until the late 19th century, when Von Wecker developed a more systematic approach that included the use of cocaine anaesthesia and specially designed instruments for ink delivery(1).

Taylor later used bundles of needles. In 1901, Nieden developed a tattooing tool like a fountain pen. Armaignac added a small funnel fixed to the cornea, filling it with China ink and tattooing with a needle to create a round, pupil-like effect.

KTP has been used to treat glare from iris loss, trauma, or aniridia, reduce photophobia, and manage intractable diplopia. It's also helpful in improving cosmetic appearance in blind or sighted eyes and has been applied in limbal dermoids. Despite modern contact lenses and surface reconstruction, KTP remains a useful option for those intolerant to lenses or at risk of corneal grafts (1-3).

Traditional techniques use dye after epithelial removal, but it can cause pain, colour fading, and perforation. Intrastromal methods offer better outcomes but still pose risks. Femtosecond laser-assisted KTP is a newer, safer method with improved precision and cosmetic results (1).

The process, in simple terms, means permanently changing the cornea from clear to opaque, which covers the natural iris colour inside (3).

Lumineyes, turn brown eyes blue with new laser technology, brown eyes hide blue pigment underneath; it is as simple as that. So, it is depigmenting of the iris, and thus, brown eyes become blue. So, in simple terms, the person who wishes this procedure walks in with their natural born colour eyes, and leaves with brand-new baby blue eyes.

It has serious sequelae; however, most are downplayed unknowingly.

Pigments:

When KTP was in its infancy, various pigments were used, but it's limited now (Figure 1). The pigments used include Indian ink, organic colours, Chinese ink, animal uveal pigment, platinum chloride, and even soot. CE mark (Conformit  Europ ene) pigments are made up of a variety of materials, such as lactic acid, propanediol, and other micronized minerals. These pigments have various colours, such as black, green, and brown (3).

A commonly performed method today is manual intralaminar keratopigmentation, in which a small corneal pocket is created and filled with pigment to achieve the desired colour change (3).

Many patients undergoing KTP for medical reasons have visual issues, not cosmetic concerns. Some studies suggest using a surgical marking pen over a peripheral iridotomy to let patients preview the post-KTP cosmetic

Figure 1: the technique of KTP



cosmetic result. If acceptable, KTP can proceed. The procedure begins by creating a corneal pocket at a thickness of 40–50%. A radial incision is then made using a diamond knife, followed by intralamellar and circumferential dissection to the blade's full depth. Pigment is injected into the corneal tunnel using a 27-gauge needle. The number and size of incisions depend on the iris defect. This technique is safe, quick, and well-tolerated (3).

Keratopigmentation (KTP) includes several techniques (Figure 1). **Superficial manual KTP (SMK)**, the earliest method, uses a needle to puncture the cornea and deposit pigment, but is now rarely used, except for small defects. **Superficial automated KTP (SAK)** uses a device to micro-puncture the anterior stroma to 120 µm, allowing better pigment volume and cosmetic effect. Both use topical or peribulbar anaesthesia. **Femtosecond laser-assisted KTP (FAK)** is a newer, precise technique utilising a laser to create one or two stromal tunnels for pigment injection (1–3). It is reported to be safe, precise, tolerable, and easier to perform based on tunnel formation and good healing, plus ensuring no history of corneal or retinal damage as the suction can worsen their integrity and cause holes and tears (8). It improves both cosmetic and visual outcomes, especially in light-coloured eyes, and is safer with fewer complications than earlier methods.

Cosmetic KTP is used merely to improve the appearance of disfiguring corneal opacities or uneven eye colour, which can impact a person's confidence and quality of life. Today, various corneal tattooing techniques are available to permanently correct these aesthetic concerns. These methods help restore a more natural look to the eye by masking colour changes. In some cases, individuals also seek corneal tattooing purely for cosmetic reasons, aiming to enhance or change their natural eye colour. This elective option is growing in popularity among those wanting a subtle or significant eye colour change without the use of lenses or surgery (3).

Complications of such procedures are commonly classified by the time of the occurrence into intraoperative and postoperative events. Intraoperative complications mainly include perforation, corneal melting, corneal infections, epithelial erosions, dye leakage into the conjunctival space or anterior chamber, and any surgical malpractices (technical mistakes)(4). Whereas, late-onset complications consist of light sensitivity, inconsistent dyeing of the opacity, fading of pigments, uveitis, corneal oedema, conjunctivitis, epithelial defects, and any visual field limitations (4).

The complications of KTP are classified into organic and functional complications. The toxicity of the pigments and their durability have been one of the main concerns.

Visual field limitation, light sensitivity, and MRI alterations are considered functional complications. Change in colour, colour fading, and neovascularization are described as organic complications. Potential risks of KTP include corneal perforation, toxic reaction to pigment, microbial infection, and undesirable migration of pigment (4).

There are mixed opinions about MRI safety after KTP.

Concerns have been raised about the interaction between certain pigments and MRI, particularly when metallic elements are present. While a handful of reports describe image distortion or discomfort during scans performed shortly after the procedure, other investigations have not confirmed significant safety problems (3).

A rare complication of KTP is granulomatous keratitis, often linked to multiple stromal punctures. This condition involves stromal infiltration and a granulomatous response around the pigment, even without any infection by bacteria, fungi, or viruses, indicating a non-infectious inflammatory reaction to the procedure (3). Additionally, any foreign body insertion would have its implications, whether soon or in the years to come, which is currently unknown (3).

The created colour layer can obscure the underlying ocular pathology, and yet people still choose risky eye colour-changing procedures for identity and self-esteem, influenced by culture and social media, despite the blindness risks (4). While commercial growth speeds innovation, many treatments lack proven safety. Young patients face future surgery challenges, and hidden eye diseases may go unnoticed, causing serious harm, like cataracts and other eye issues (4).

In simple terms, even if the laser worked, it would likely cause glaucoma in almost everyone. The eye works like a kitchen sink — the ciliary body acts like a tap, producing fluid, and the trabecular meshwork is the drain that clears it. The laser would release pigment into this flow, clogging the drain and causing pressure to build up, leading to glaucoma and likely vision loss (4). Additionally, the iris is a very vascular organ and can bleed leading to the rise in the pressure inside the eye (4).

Each elective cosmetic surgery has an estimated cost of \$6000 per eye, and some people opt for mismatched eye colours (heterochromia iridis), which costs \$ 12000 (3).

Historical evolution of eye colour changes (Tables -1 and 2): it's not new, though (3).

1- During the Second World War (WWII), unethical experiments were carried out on concentration camp prisoners in an attempt to alter eye colour, including the use of drug-based drops which was called project eye colour (Projekt Augenfarbe). These trials, led by Nazi physicians, caused suffering without producing any meaningful results. Magnussen's post-war publication attempts were blocked due to ethical concerns (1-2).

2- Since 1996, prostaglandin eye drops for glaucoma, like Latanoprost® and Bimatoprost®, have been known to darken the iris, especially in light-coloured eyes. This occurs due to increased melanin. Older adults and some ethnicities, like Japanese individuals, are more affected. No eye colour-changing products exist yet, though lash-enhancing versions do (3).

3- Since 2011, unapproved eye drops like iColour claim to lighten eye colour using N-acetylglucosamine, which may reduce melanin. However, this effect isn't proven in iris cells. These products lack FDA or CE approval, raising safety concerns like infections, inflammation, allergic reactions, or even retinal damage, risking vision loss (3).

4- Iris implants, originally designed for medical use, became popular for cosmetic reasons. The NewColorIris implant, launched in 2006, caused severe complications like glaucoma and blindness, leading to its removal from the market. Its successor, BrightOcular, also lacks FDA/CE approval and continues to cause similar issues, despite ongoing global use. Having said this, silicone iris implant surgery is not widely recommended due to potential complications, corneal decompensation, uveitis, and glaucoma, leaving some patients nearly

blind. Such a procedure can be considered malpractice and should be discouraged (3).

5- Laser treatments to turn brown eyes blue gained attention in 2011. Q-switched Nd: YAG lasers are now claimed to be the most effective, though not fully proven. These non-approved procedures target iris melanin but can cause serious issues like uveitis and pigmentary glaucoma, sometimes resulting in permanent vision damage (3).

6- Keratopigmentation, or corneal tattooing, dates back nearly 2000 years to Galen of Pergamon, who used it to mask corneal opacities. Modern techniques began in 1869. Today, it's used medically for light sensitivity or iris defects. Recently, interest has grown in using it purely to change eye colour cosmetically. Keratopigmentation uses different methods. Traditional techniques, based on Von Wecker's method, insert pigment into superficial corneal layers using manual or automated needle punctures. Complications include colour fading, perforation, and uveitis. Modern methods use femtosecond lasers to create stromal pockets for pigment injection, offering more precision but still carry risks. Intrastromal keratopigmentation complications include corneal perforation (less with femtosecond lasers), infection, neovascularisation, allergic reactions, pigment migration, colour changes, and visual issues. Third-generation mineral micronized pigments, like CE-marked Biochromaeyes®, cause fewer pigment-related problems than older pigments such as Indian ink or animal uveal pigment (3).

Conclusion

Corneal tattooing has existed for nearly 2,000 years and can be used therapeutically and cosmetically (8). Since 2011, iris implants and lasers have become the most commonly used tools to make that dream a reality for those who want a permanent change in eye colour.

Intrastromal keratopigmentation carries risks like infection, pigment migration, and vision problems. It is often driven by identity and self-esteem (3). Since most patients are young, long-term issues may appear later. Patients may overlook future issues, especially with cataract surgery. The pigment can also mask eye diseases. Despite its appeal, this cosmetic procedure poses both short- and long-term risks to eye health. Although the technique shows promising results in patients with ocular pathology, there is little research and, lack of standardization on the use of keratopigmentation for purely cosmetic procedures on healthy eyes, while exploring its safety(5). Changing eye colour in healthy eyes for strictly cosmetic reasons is a risky procedure to take. Procedures can cause grim complications, missed eye diseases, and problems with future surgeries. These risks may lead to irreversible damage, vision loss, or even loss of the eye, and in rare cases, threaten life itself. Also, tint fading and corneal neovascularization can be a possible problem(6).

Table 1: summary of eye colouring:

Contact lenses	Various other methods, drops, laser, tattooing
Safer option when used properly	Iris implants often banned and riskier
Temporary and disposal	Permanent and controversial with unknown long-term safety
<ul style="list-style-type: none"> • can pose some risks, particularly when used improperly or for extended periods. These risks include • infections • corneal problems • irritation 	<ul style="list-style-type: none"> • Potential dangers include: • Glaucoma (increased eye pressure) and potential blindness • Uveitis (eye inflammation) • Vision loss or damage • Uneven eye colour • Corneal damage • Photosensitivity

Table 2: different techniques utilised

Different techniques	Possible and raised complications
Eye drops containing adrenaline were used in WWII; prostaglandin drops used in glaucoma since 1996	It caused increased iris pigmentation
Commercial drops, 2011	Not effective and dangerous
Iris implants, 2011	Corneal decompensation, uveitis, and glaucoma, banned and removed as it left patients blind
Commercial laser, 2011, to make brown eyes blue	Possible complications are anterior uveitis, and pigmentary glaucoma
Modern intrastromal keratopigmentation	Complications include cornea perforation, bacterial infection, allergic or toxic reaction to pigmentation, migration of pigment, functional complications like visual field limitation, and light sensitivity, obscure ocular pathology of the cornea or iris

The bottom line is it's not recommended unless future studies prove it's safe. Most eye experts strongly warn against it.

So, the lingering question is whether it is worth the risk at all, where the demander is insecure about their natural eye colour, and what is the future health of those eyes, as there aren't many extensive studies yet, and there is a lack of data about its safety?

Also, we know albino patients who have pigment deficiency, are sensitive to light. Do those eyes' pupils dilate at all and respond to the natural light? Also, what about those with blue eyes who want dark eyes? All the evidence raised and the clinical studies published make it clear that KTP offers today an excellent option for the corneal surgeon, providing acceptable functional and cosmetic outcomes in cases of only disabled corneas, irregular pupils, or traumatic iris injuries, which can be performed using different procedures (1,4). Moreover, I am wondering if those providers took the chance, and had tried the procedure in the first place themselves to be the role model for their claimed safe procedure to have your dream eye colours, as some promote heavily on social media multiple platforms, and risk their sight, their most important sense in the world, to see and appreciate. Anyone who wants to use that technique should be vigilant and weigh the benefits against the risks. After all, it is all based on self-acceptance, and loving your inborn eyes, which is your unique identity, and not photocopying aliens, which is the basis of the cosmetic industry when it comes to lip fillers and the Botox used, creating distorted, obsessed nations.

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