

Conjunctival Tattoo With Inadvertent Globe Penetration and Associated Complications

Natasha Ferreira Santos da Cruz, MD, Kátia Santana Santos, MD,
Michelle de Lima Farah, MD, and Sergio Felberg, MD

Purpose: To report a case of conjunctival tattooing for cosmetic purposes with inadvertent globe penetration resulting in severe inflammation, capsular lens opacity, and secondary glaucoma.

Methods: Case report.

Results: A 25-year-old woman experienced severe ocular pain and decreased vision in the left eye after conjunctival tattooing for cosmetic purposes on the previous day. Slit-lamp examination revealed black deposits over the conjunctiva, corneal endothelium, anterior chamber angle, iris, and anterior capsular lens due to the tattooing pigment. In addition, severe anterior uveitis triggered by the pigments and, later, secondary glaucoma were diagnosed. The patient underwent clinical and surgical treatments to control ocular inflammation and intraocular pressure. Three months after the injury, the patient was still under follow-up treatment in an effort to control the complications of the eyeball tattooing.

Conclusions: An unusual case of conjunctival tattooing resulted in severe inflammation, capsular lens opacity, and secondary glaucoma. Because of the increasing popularity of eyeball tattooing, coupled with the procedure being performed by untrained professionals, potentially severe complications of this procedure may become more common.

Key Words: tattooing, uveitis, glaucoma

(*Cornea* 2017;36:625–627)

BACKGROUND

Corneal tattooing has been used for centuries for cosmetic purposes in opaque corneas with poor visual potential,^{1,2} although conjunctival tattooing is more uncommon. In 2011³ and 2014,⁴ medical conjunctival micropigment tattooing was reported to achieve satisfactory results with no postoperative complications.

However, injection of a colored dye at the ocular surface is a new phenomenon in body modification that is an

increasingly popular type of tattoo. As previously reported, tattooing by untrained professionals may result in complications, such as inadvertent penetration of the globe, severe inflammation, and retinal detachment.⁵ This case report describes a patient who received conjunctival tattooing for cosmetic purposes with inadvertent globe penetration, which resulted in severe ocular inflammation, capsular lens opacity, and secondary glaucoma.

CASE REPORT

A 25-year-old woman presented with severe ocular pain and decreased vision in the left eye. The patient stated that she underwent conjunctival tattooing in her left eye the day before in a tattoo studio. According to the patient, the pigment used was conventional ink used to tattoo the skin, known as “eternal ink.” She also had other tattoos on her face and over her entire body. The patient denied having systemic or ocular diseases.

At the time of admission, visual acuity (VA) was 20/20 in the right eye and 20/70 in the left (ie, tattooed) eye. The pupillary reflexes were normal. A slit-lamp examination revealed no abnormalities of the right eye, but in the left eye, black deposits from the tattooing pigment were noted over the conjunctiva, corneal endothelium, anterior chamber angle, iris, and anterior capsular lens. The ophthalmic examination also showed a hypopyon of 1.5 mm and an intense anterior chamber cellular reaction. On gonioscopy, the pigment was observed throughout the trabecular meshwork system. The intraocular pressure (IOP) was 12 mm Hg in the right eye and 10 mm Hg in the left eye. A posterior segment view was not possible because of the lack of transparency of the ocular media (Fig. 1).

Posterior segment ultrasonography of the left eye showed slight intravitreal punctiform echoes, suggestive of secondary inflammation due to anterior uveitis. Ultrasound biomicroscopy punctiform echoes of homogeneous high reflectivity at the anterior chamber, compatible with tattoo pigments, were noted. Diffuse thickening of the conjunctiva with anechoic areas suggestive of conjunctival edema was also observed.

Initial clinical treatment was prescribed for anterior uveitis with 0.1% dexamethasone, 0.5% moxifloxacin, and 1% tropicamide eye drops. Fourteen days after control of inflammation was achieved, anterior chamber washout surgery was performed to remove abundant colored material. During the procedure, numerous black pigments that were floating in the anterior chamber, iris, and anterior capsule lens were removed, and the material was sent for laboratory analysis. However, some pigment residues that were adhering to the intraocular tissue remained inside the eye.

The samples tested negative for the growth of microorganisms, and the anatomopathological analysis showed a black particulate material with a polymorphonuclear infiltrate and connective

Received for publication October 17, 2016; revision received November 22, 2016; accepted December 25, 2016. Published online ahead of print March 1, 2017.

From the Department of Ophthalmology, Santa Casa de Misericórdia de São Paulo, São Paulo, Brazil.

The authors have no funding or conflicts of interest to disclose.

Reprints: Natasha Ferreira Santos da Cruz, MD, Rua Dr Cesário Mota Júnior, 112, Vila Buarque, São Paulo 01121-020, Brazil (e-mail: natashafscruz@gmail.com).

Copyright © 2017 Wolters Kluwer Health, Inc. All rights reserved.

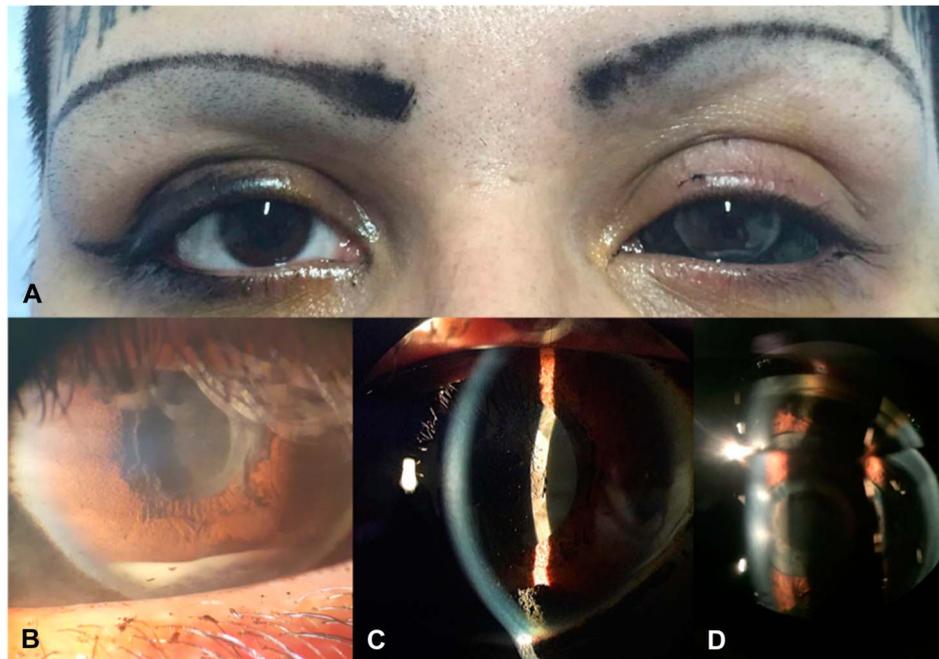


FIGURE 1. A, Ectoscopy view of conjunctival tattooing. B, Black deposits of the tattoo pigment on the conjunctiva, corneal endothelium, iris, and anterior capsular lens. C, Intense anterior chamber cellular reaction and flare. D, Pigments visualized over the entire trabecular system.

tissue of the conjunctiva collagenized without epithelium. According to the product description, the ink used for the tattoo was primarily composed of organic pigment, distilled water, witch hazel, and alcohol.

After the procedure, the VA improved to 20/25 in the left eye. The inflammation completely disappeared after 45 days, but there was still some pigment associated with the anterior chamber, conjunctiva, iris, and anterior capsular lens, with synechia from the 11 o'clock to 12 o'clock position and iris atrophy. Fundoscopy was performed but no abnormalities were found.

Two weeks after surgery, the IOP increased to 43 mm Hg; even with 2 topical medications, 0.2% brimonidine and 0.5% timolol, and 250 mg oral acetazolamide, the IOP remained high. Trabeculectomy (TREC) was performed to control the ocular pressure and prevent optic nerve damage.

At the first follow-up after TREC, the IOP was 2 mm Hg without treatment with antihypertensive medications and a flat

anterior chamber due to hyperfiltration fistula was noted. After 1 week, the IOP again increased to 44 mm Hg, probably because of fast closure of the fistula as a result of severe fibrosis of the conjunctiva. The patient complained of ocular pain and nausea, and the VA of the left eye decreased to hand motion. Brimonidine, timolol, and acetazolamide were then prescribed for acute glaucoma.

At 1 month after surgery, the VA was 20/100 and biomicroscopy revealed 2+ corneal edema, a TREC bleb elevated with a surrounding fibrotic ring, progression of iris atrophy, and increased lens opacity. Cupping of the optic nerve retained a physiological disc size throughout the follow-up. The TREC ostium was patent when observed by gonioscopy (Fig. 2).

The patient is still in follow-up and is being considered for a possible drainage implant to control the complications of the eyeball tattooing. Phacoemulsification will only be considered after control of the IOP.

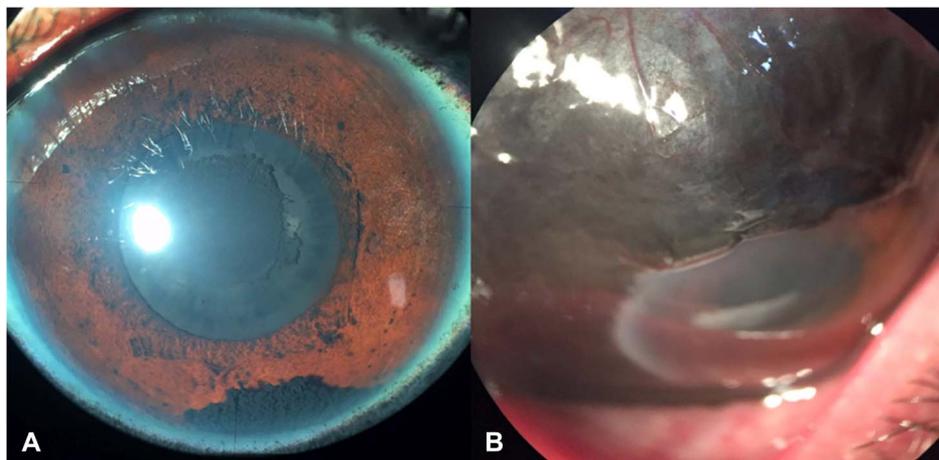


FIGURE 2. A, Control of uveitis after initial clinical treatment with the pigment in the anterior chamber. B, A TREC bubble elevated by a surrounding fibrotic ring.

DISCUSSION

Despite being an ancient practice, tattooing has dramatically increased among teenagers and young adults as a cosmetic and decorative body art form.⁶ In addition, eyeball tattooing is gradually becoming popular worldwide.

Because conjunctival tattooing has only recently been introduced, there is no legislation concerning its use in most countries. In the state of Georgia in the United States, tattoos are forbidden within an inch of the eye socket.⁷ However, Brazil still lacks legislation on eyeball tattooing. The only limitation is the prohibition of “eternal ink,” because it has not been approved for use within Brazil by the National Health Surveillance Agency.⁸

Pigments used for skin tattoos, such as those in this case report, are both organic and inorganic. Inorganic pigments are minerals often found in nature. Organic pigments, like the one used by the patient, are mainly synthetic and contain carbon.⁹ Several adverse health effects from tattoos, ranging from skin irritation to tumor formation, have been previously reported,¹⁰ and a frequently used black pigment comprises mainly carcinogenic polycyclic aromatic hydrocarbons.⁹ Conjunctival tattooing is mainly performed by people without medical training, with no surgical instruments or microscope, which may increase the risks of ocular complications.

There is insufficient information available on the complications of eye tattoos, but because the procedure involves introduction of a needle into the eye, it is probable that there is an increased risk of globe penetration, toxicity, inflammation, inadvertent injection of pigment, traumatic cataract, retinal detachment, and endophthalmitis. Most important, it also confers a risk of blindness.^{5,11}

Furthermore, it is important to note that a tattoo not applied directly to the eye may also result in ocular complications. There have been cases of uveitis associated with a dermal tattoo, caused by a delayed allergic reaction to the injected pigment characterized by simultaneous inflammation of the eyes and skin.^{12–14}

As shown by the present case, there are potential risks associated with conjunctival tattooing of the eye, but there has been no previous report of inadvertent penetration of the globe

during eye tattooing, which can lead to possible complications such as secondary glaucoma and capsular opacity.

CONCLUSIONS

There are no safety procedures for cosmetic conjunctival tattooing. The general population should be aware of this limitation because the increasing popularity of this new procedure, coupled with its application by untrained professionals, can result in serious complications. It is therefore important to notify persons interested in this art form about the risks of blindness associated with the procedure.

REFERENCES

1. Mannis MJ, Eghbali K, Schwab IR. Keratopigmentation: a review of corneal tattooing. *Cornea*. 1999;18:633–637.
2. Pitz S, Jahn R, Frisch L, et al. Corneal tattooing: an alternative treatment for disfiguring corneal scars. *Br J Ophthalmol*. 2002;86:397–399.
3. Jo DH, KeunHan Y, Kwon JW. Conjunctival tattooing after evisceration for cosmesis. *Can J Ophthalmol*. 2011;46:204.
4. Paik JS, Lee YK, Doh SH. A patient with combined corneal and ingrowing conjunctival tissue tattooing by micropigmentation method. *J Craniofac Surg*. 2014;25:e170–e172.
5. Jalil A, Ivanova T, Bonshek R, et al. Unique case of eyeball tattooing leading to ocular penetration and intraocular tattoo pigment deposition. *Clin Exp Ophthalmol*. 2015;43:594–596.
6. Ortiz AE, Alster TS. Rising concern over cosmetic tattoos. *Dermatol Surg*. 2012;38:424–429.
7. Georgia Code. Tattooing. 2010. Available at: <http://law.justia.com/codes/georgia/2010/title-16/chapter-12/article-1/16-12-5>. Accessed October 3, 2016.
8. Agência Nacional de Vigilância Sanitária (ANVISA). Resolução—RE N° 1.679. 2014. Available at: <http://www.cvs.saude.sp.gov.br/up/Resolucao%20RE%201.679-2014.ANVISA.pdf>. Accessed October 3, 2016.
9. Prior G. Tattoo inks: legislation, pigments, metals and chemical analysis. *Curr Probl Dermatol*. 2015;48:152–157.
10. Wenzel SM, Rittmann I, Landthaler M, et al. Adverse reactions after tattooing: review of the literature and comparison to results of a survey. *Dermatology*. 2013;226:138–147.
11. Brodie J, El Galhud H, Bates A. A case of episcleral tattooing—an emerging body modification trend. *BMC Ophthalmol*. 2015;15:95.
12. Ostheimer TA, Burkholder BM, Leung TG, et al. Tattoo-associated uveitis. *Am J Ophthalmol*. 2014;158:637–643.
13. Pandya VB, Hooper CY, Essex RW, et al. Tattoo-associated uveitis. *Am J Ophthalmol*. 2014;158:1355–1356.
14. Reddy AK, Shildkrot Y, Newman SA, et al. T-lymphocyte predominance and cellular atypia in tattoo-associated uveitis. *JAMA Ophthalmol*. 2015;133:1356–1357.