

# Cosmetic pigmentation with innovative technique as an alternative for esthetic treatment in an eviscerated eye

Pigmentação cosmética com técnica inovadora como alternativa para tratamento estético em um olho eviscerado

Giovanni Garotti<sup>1</sup> , Laura Goldfarb Cyrino<sup>1</sup> , Paulo Vigga<sup>1</sup> , Ruth Miyuki Santo<sup>1</sup> , Suzana Matayoshi<sup>1</sup> 

<sup>1</sup> Hospital das Clínicas, Universidade de São Paulo, São Paulo, SP, Brazil.

**How to cite:**

Garotti G, Cyrino LG, Vigga P, Santo RM, Matayoshi S. Cosmetic pigmentation with innovative technique as an alternative for aesthetic treatment in an eviscerated eye. Rev Bras Oftalmol. 2025;84:e0024.

**doi:**

<https://doi.org/10.37039/1982.8551.20250024>

**Keywords:**

Pigmentation; Tattooing; Puncture; Cosmetic techniques; Esthetics; Personal satisfaction; Quality of life

**Descritores:**

Pigmentação; Tatuagem; Punções; Técnicas cosméticas; Estética; Satisfação pessoal; Qualidade de vida

## ABSTRACT

The aim of this case report was to evaluate the outcome and methodology of a novel technique for conjunctival pigmentation using modified micropuncture to enhance the appearance of an ocular graft from an eviscerated eye. This approach used modified micropuncture for conjunctival pigmentation and sclera in an ocular graft. Due to the lack of a cornea, multiple sessions were required to ensure proper pigment penetration. The procedure's effectiveness was evaluated based on aesthetic results and patient satisfaction. The technique achieved a favorable aesthetic outcome and was cost-effective. Although additional sessions were necessary for adequate pigment absorption, the patient experienced high satisfaction without discomfort. Notable improvements were observed in social, professional, and self-esteem aspects. The patient indicated a strong likelihood of recommending the procedure. The modified micropuncture technique is a safe, efficient, and cost-effective method with a significant positive impact on the patient's quality of life, enhancing both aesthetic outcomes and self-esteem.

## RESUMO

Os objetivos deste relato foram avaliar o resultado e a metodologia de uma técnica inovadora para pigmentação da conjuntiva ocular utilizando micropuntura modificada para melhorar a aparência de um enxerto ocular de um olho eviscerado. A abordagem empregou micropuntura modificada para pigmentação da conjuntiva e esclera em um enxerto ocular. Devido à ausência de córnea, foram necessárias múltiplas sessões para garantir a penetração adequada do pigmento. A eficácia do procedimento foi avaliada com base nos resultados estéticos e na satisfação do paciente. A técnica obteve um resultado estético favorável e foi custo-efetiva. Embora sessões adicionais tenham sido necessárias para a absorção adequada do pigmento, o paciente relatou alta satisfação sem desconforto. Melhorias notáveis foram observadas nos aspectos social, profissional e na autoestima. O paciente demonstrou grande probabilidade de recomendar o procedimento. A técnica de micropuntura modificada é segura, eficiente e custo-efetiva, com impacto positivo significativo na qualidade de vida do paciente, melhorando tanto os resultados estéticos quanto a autoestima.

**Received on:**  
Aug 12, 2024

**Accepted on:**  
Dec 30, 2024

**Corresponding author:**

Giovanni Garotti  
Avenida Doutor Enéas de Carvalho Aguiar,  
255 - 6th floor, room 6119. Cerqueira César  
- São Paulo -SP. ZIP CODE: 05403-000  
E-mail: gigarotti@gmail.com

**Institution:**

Hospital das Clínicas, Universidade de São  
Paulo, São Paulo, SP, Brazil.

**Conflict of interest:**  
no conflict of interest.

**Financial support:**  
no financial support for this work.



Copyright ©2025

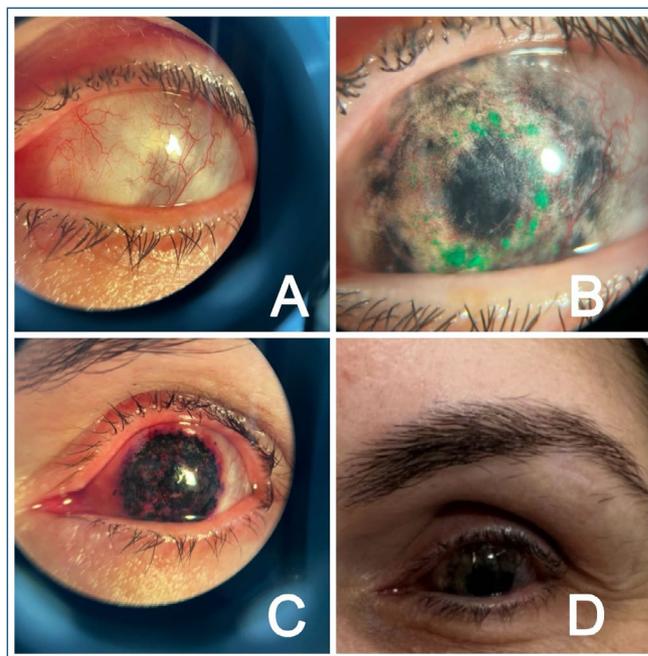
## INTRODUCTION

Anterior superficial pigmentation, or corneal stromal tattooing, is a method used to cosmetically treat corneal lesions, such as leukomas, which cause opacification and alteration of the eye's healthy appearance.<sup>(1)</sup> In the following case report, we outline the utilization of a novel technique involving micropuncture on the conjunctiva for ocular cosmetic pigmentation. The objective is to improve the visual aesthetics of the grafted eye years after an evisceration, in which other cosmetic interventions, such as using ocular prosthetics, were impeded. The following case report was executed in accordance with Health Insurance Portability and Accountability Act regulations and the principles of the Declaration of Helsinki. Written consent was also obtained from the patient, CAAE No. 76712423.5.0000.0068.

### Case report

A 54-year-old health professional with a history of congenital cataract and subsequent glaucoma in her left eye underwent childhood surgeries and later an evisceration of the right eye at 15 years of age. A scleral graft using a porous sphere was introduced in 2004. After having used a cosmetic eye prosthesis for 37 years, the elevation of the graft in 2019 led to difficulties in using it properly. Seeking aesthetic treatment, she was evaluated in 2023 for contact lens (CL) filter with corneal design. However, due to the significantly elevated graft (Figure 1A), the use of a filtering CL was not possible, impacting her physical appearance, causing dissatisfaction, and affecting her quality of life. Thus, we opted for an alternative treatment: cosmetic micropigmentation with an innovative technique of manual micropuncture under the remaining ocular conjunctiva.

For the surgical technique of manual micropigmentation, the following were used: 0.18 mm thick needle, strung in sets of 3 to 12 needles according to the region to be treated; organic pigments in single-dose ANVISA-Electric sachets Ink of different colors in order to mimic the contralateral eye; stainless steel blepharostat; and corneal scarifier spatula. The process includes asepsis with 3% povidone-iodine, blepharostat placement, anesthetic eye drops (hydrochloride 5 mg/mL proximetacaine) and 5% povidone-iodine, conjunctiva de-epithelialization without removing it, and needling at the approximate depth of 80  $\mu$ m with pigmented ink on sclera. The session lasts around 20 minutes with an average cost of \$10. Post-procedure, patients use ciprofloxacin + dexamethasone eye drops and undergo evaluations on days 1, 3, 7, and 30.



**Figure 1.** (A) Ocular physical examination of the patient. (B) Left eye after first session of pigmentation. (C) Patient after third session of pigmentation. (D) Patient after fourth session of pigmentation.

In total, four sessions of ocular pigmentation were carried out until we were able to achieve coloration similar to the contralateral eye.

There was a need for greater number of sessions considering what is usually done in pigmentation of the anterior stroma of the cornea, since, due to previous evisceration and grafting with a porous sphere, the patient did not have the cornea, only the conjunctiva and sclera, which hindered the penetration of pigments. According to figure 1, we can follow the progression of pigmentation over time throughout the sessions.

After the end of the treatment, we applied a questionnaire (Figure 2) adapted<sup>(2)</sup> to assess the degree of satisfaction with the procedure and impact on the patient's quality of life. The results were very positive. The patient reported high satisfaction with the aesthetic outcome, experiencing no postoperative discomfort. There was a notable enhancement in social, professional well-being, and self-esteem. The patient expressed willingness to repeat and recommend the procedure. As a health professional, the patient refers that the significant improvement in her physical appearance had a profound impact on her career and self-esteem (Figure 3).

## DISCUSSION

This case has its importance because it is an effective description of the use of a modified anterior surface pigmentation

Questions:	Answers:
Satisfaction with the aesthetic result	1. Not satisfied 2. Satisfied ③ Very satisfied
Discomfort in the postoperative period (pain or malaise)	1. High 2. Medium ③ Minimum
Social and professional well-being	1. Worsened 2. Same ③ Got better
Self-esteem after the procedure	1. Worsened 2. Same ③ Got better
Would repeat the procedure	① Yes 2. No
Would indicate the procedure to other individuals	① Yes 2. No

**Figure 2.** Questionnaire applied after the ocular pigmentation procedure.



**Figure 3.** Before and after physical aspect of the pigmentation procedure.

technique in a patient who had no cornea, only sclera and conjunctiva. There are different pigmentation techniques, which ultimately consist of the inoculation of biocompatible pigments in the anterior corneal stroma.<sup>(3-5)</sup> The application of pigment can be performed by stromal micropuncture (tebori) or associated with keratectomy or lamellar keratoplasty with femtosecond tunneling.<sup>(6-8)</sup>

In this case, the Tebori de Garotti technique was used, created by the author himself, which uses 18 mm thick

nanoneedles, purposely grouped in an uneven linear format, with the purpose of optimizing perforation with the least possible tissue trauma. This innovation proved to be effective in transporting the pigment to the conjunctival and intrascleral tissue.

The cornea pigmentation procedure can be used therapeutically for patients with glare complaints, usually associated with loss of iris tissue, whether due to atrophy or trauma.<sup>(9-12)</sup> However, other techniques have been currently applied for these purposes, while the use of ocular pigmentation prevails for cosmetic cases in blind eyes, mainly for patients who cannot tolerate cosmetic or high-risk CL for penetrating keratoplasty.<sup>(1)</sup>

Due to the patient's ineligibility for alternatives like prostheses and the absence of a cornea post-eye evisceration, conventional aesthetic correction methods did not fully apply. Opting for a modified pigmentation technique yielded exceptionally satisfactory results, marking it as an innovative approach. Although there is the possibility of future loss of pigments in conjunctival region, it is believed that intrascleral pigments will remain deposited, maintaining the satisfactory cosmetic results obtained. This unique case serves as a catalyst for change, considering its cost-effectiveness and the scenario where it is done. Despite potential non-homogeneous pigmentation, color loss, and rare complications like intraoperative corneal perforation and post-procedure uveitis, variations in pigmentation techniques demonstrate good reliability and safety, with a low complication rate.<sup>(1,5)</sup>

This approach, which uses accessible and cost-effective materials, offers a quick, outpatient procedure with topical anesthesia. Notably, it is easily learnable by ophthalmologists from various specialties, showcasing potential to significantly improve the self-esteem and quality of life for patients with visually compromised blind eyes in resource-limited centers.

## AUTHORS' CONTRIBUTION

Garotti G, Goldfarb L, Vigga P, Santo RM, and Matayoshi S contributed equally to the conception and design of the study, analysis and interpretation of the results, writing, and critical revision of the manuscript. All authors approved the final version of the manuscript and are responsible for all aspects of it, including the accuracy and integrity of the work.

## REFERENCES

1. Hasani H, Es'haghi A, Rafatnia S, Alilou S, Abolmaali M. Keratopigmentation: a comprehensive review. *Eye (Lond)*. 2020;34(6):1039-46.

2. Xavier LD, Becker CU, Salomão HM, Costa AX. Ceratopigmentação (tatuagem corneana): utilização de técnicas combinadas para melhora estética em olhos de pacientes com opacidades corneanas. *Rev Bras Oftalmol.* 2022;81:e0031.
3. Amesty MA, Alió JL, Rodríguez AE. Corneal tolerance to micronised mineral pigments for keratopigmentation. *Br J Ophthalmol.* 2014;98(12):1756-60.
4. Amesty MA, Rodríguez AE, Hernández E, De Miguel MP, Alió JL. Tolerance of Micronized mineral pigments for intrastromal keratopigmentation: a histopathology and immunopathology experimental study. *Cornea.* 2016;35(9):1199-205.
5. Al-Shymali O, Rodríguez A, Amesty M, Alió J. Superficial keratopigmentation: an alternative solution for patients with cosmetically or functionally impaired eyes. *Cornea.* 2018;38.
6. Alió JL, Sirerol B, Walewska-Szafran A, Miranda M. Corneal tattooing (keratopigmentation) with new mineral micronised pigments to restore cosmetic appearance in severely impaired eyes. *Br J Ophthalmol.* 2010;94(2):245-9.
7. Alió JL, Rodríguez AE, Toffaha BT, El Aswad A. Femtosecond-assisted keratopigmentation double tunnel technique in the management of a case of Urrets-Zavalía syndrome. *Cornea.* 2012;31(9):1071-4.
8. Morales-Wong F, Navas A, Yáñez-Oviedo GE, Mohamed-Noriega K. Femtosecond laser applications in corneal surgery. *Taiwan J Ophthalmol.* 2023;13(3):293-305.
9. Remky A, Redbrake C, Wenzel M. Intrastromal corneal tattooing for iris defects. *J Cataract Refract Surg.* 1998;24:1285-7.
10. Alió JL, Rodríguez AE, Toffaha BT. Keratopigmentation (corneal tattooing) for the management of visual disabilities of the eye related to iris defects. *Br J Ophthalmol.* 2011;95(10):1397-401.
11. Hirsbein D, Gardea E, Brasseur G, Muraine M. [Corneal tattooing for iris defects]. *J Fr Ophtalmol.* 2008;31(2):155-64. French.
12. Alió JL, Rodríguez AE, Toffaha BT, Piñero DP, Moreno LJ. Femtosecond-assisted keratopigmentation for functional and cosmetic restoration in essential iris atrophy. *J Cataract Refract Surg.* 2011;37(10):1744-7.