

INTRODUCTION

Facial aging promotes structural changes in the skin, including the infraorbital region, with consequences such as the loss of collagen, elastin, and hyaluronic acid, resulting in lines, wrinkles, and decreased elasticity (skin laxity). The importance of knowledge of the anatomy in this area is emphasized to ensure effective anesthesia and risk reduction in procedures. The study proposed the combination of polydioxanone (PDO) threads and platelet-rich fibrin (PRF) to stimulate collagen in the infraorbital region. The use of PDO in facial aesthetics emerged from its property to induce collagen synthesis, while PRF, a second-generation blood concentrate, was chosen for its ability to promote collagen production with low risks. The clinical case involves a 44-year-old patient, classified as Glogau type 3 (indicating wrinkles at rest, pronounced sagging, and prominent nasojugal groove, reflecting advanced aging), who received treatment with PDO and A-PRF threads in an initial session, followed by two additional sessions with only A-PRF, with an 85-day follow-up period.

POLYDIOXANONE THREADS (PDO)

Polydioxanone (PDO) threads have been employed for subcutaneous sutures for an extended period. The aesthetic application of this technique commenced in 2006 when Dr. Kwon Han observed a rejuvenating effect on the periscar tissue upon utilizing these PDO threads. Smooth PDO threads lack knots or locks, and they stimulate collagenogenesis, gradually substituting senescent skin with novel tissue. These threads create minor lesions triggering an inflammatory response, thereby initiating the processes of neoeelastogenesis and neocollagenesis. PDO threads exhibit prolonged tensile strength compared to alternative absorbable thread varieties. They are typically fully absorbed around 8 months post-insertion, eliciting minimal foreign body reaction, thereby facilitating wound healing and collagen production.

PLATELET-RICH FIBRIN (PRF)

Around 20 years ago, platelet concentrates derived from blood were introduced for the utilization of blood proteins as a source of growth factors to facilitate tissue regeneration. Platelet-Rich Fibrin (PRF) represents a novel generation of platelet concentrates, processed in a straightforward manner without biochemical manipulation. PRF stimulates cellular proliferation, angiogenesis, and matrix remodeling, finding extensive application in tissue regeneration and wound healing.

In the context of orofacial harmonization (HOF), we primarily employ two centrifugation techniques, both employing plastic tubes to prevent coagulation of the fibrin matrix. These methods are:

- i-PRF, at 60G (700 rpm) for 3 minutes, yielding higher leukocyte counts and a greater concentration of growth factors.
- Liquid A-PRF, at 208G (1300 rpm) for 5 minutes, capable of providing more volume (NARCOPOULOS, C; VESALA, A, 2019).

In this study, we used only liquid A-PRF because i-PRF separates hemocytes from PRF less effectively and could lead to darkening of the infraorbital region.

OBJECTIVE

The objective of this case report was to demonstrate the application of Liquid A-PRF combined with PDO threads in a patient with complaints of deepening of the nasojugal groove and lines or wrinkles in the lower eyelid, applying orofacial harmonization techniques to reduce sagging, decrease the depth of the nasojugal groove, and diminish wrinkles.

MATERIALS AND METHODS

Several clinical classifications were created to improve the understanding of aged skin, with the Glogau classification (Table 1) being the most commonly used for facial aging. However, it should be noted that these classifications are generic, yet aging occurs in an individualized manner.

For the evaluation of aesthetic improvement in the patient, we utilized the GAIS (Global Aesthetic Improvement Scale) as presented in table 2.

TABLE 1: GLOGAU SCALE

TYPE I - Absence of wrinkles/mild aging (starting from the third decade of life)	
▪ Early photoaging,	▪ Absence of keratoses (skin "wounds"),
▪ Mild pigmentation disorders,	▪ Minimal wrinkles.
TYPE II - Dynamic wrinkles/moderate aging (starting from the fourth decade of life)	
▪ Early to moderate photoaging,	▪ Palpable keratoses,
▪ Initial senile lentiginos (spots from photoaging),	▪ Initial smile lines.
TYPE III - Wrinkles at rest/advanced aging (starting from the fifth decade of life)	
▪ Advanced photoaging,	▪ Telangiectasias (visible small blood vessels on the skin),
▪ Evident dyschromias (uneven skin with multiple spots),	▪ Visible keratoses,
▪ Wrinkles at rest.	
TYPE IV - Only wrinkles/severe aging (starting from the sixth and seventh decades of life)	
▪ Intense photoaging,	▪ Pre-malignant actinic lesions (wounds that can become skin cancer),
▪ Yellow-grayish skin,	▪ Wrinkles throughout the face.

TABLE 2: GLOBAL AESTHETIC IMPROVEMENT SCALE

Score	Evaluation	Description
3	Improved tremendously	Outstanding cosmetic outcome for the patient.
2	Improved significantly	Significant improvement in the appearance from the initial condition, although not entirely optimal for this patient. A touch-up could enhance the result slightly
1	Improved	Obvious improvement in the appearance from the initial condition, but a touch-up or retreatment is indicated.
0	No changes	The appearance remains essentially the same as the original condition.
-1	Worsened	The appearance is worse than the original condition.

CASE REPORT

The patient, G.B., female, 44 years old, sought Orofacial Harmonization (HOF) treatment at a private clinic in Vitória, Espírito Santo. She reported never having undergone any prior facial aesthetic procedures. Initially, she was classified as type 3 on the Glogau scale (showing significant skin laxity and a very evident nasojugal groove) (Figure 1-a).

In the infraorbital region, the application of liquid A-PRF and PDO threads was suggested, with the first session involving the placement of the PDO thread and the initial session of liquid A-PRF, followed by two additional sessions of liquid A-PRF alone.

On September 14th of 2022, the smooth PDO thread (Bioline, 4-0, 70 cm) was prepared by placing it in a sterile 10 ml syringe with a 22Gx50mm needle (FEEL TECH CO., LTD). A percutaneous puncture was performed, and 35 cm of the thread was inserted into the infraorbital region on each side, with the needle insertion reaching the desired area, followed by thread placement, removal of the needle, cutting the thread, and then reinserting the needle until the 35 cm were deployed in a fan-shaped pattern as marked (Figure 1-b).

For obtaining platelet-rich fibrin, two white-capped plastic tubes were collected and placed in a centrifuge (SPINPLUS) at 208G rotation for 5 minutes (liquid A-PRF). A total of 6 ml of liquid A-PRF was obtained, subsequently aspirated into sterile 1 ml syringes, attached to the same needle used for the thread insertion, and then injected (with retro-injections) into the infraorbital region using the same puncture site. 1 ml of liquid A-PRF was deposited on each side (Figure 1-c).

On October 5th and 28th of 2022, the process of liquid A-PRF application was repeated without the insertion of PDO threads. However, in the third session, liquid A-PRF was deposited in the infraorbital region with retro-injections using sterile 1 ml syringes attached to 30Gx13mm needles (Figure 1-d and 1-e). On December 08th of 2022, the patient returned to the clinic for a new evaluation. 85 days after the first session, the patient was reclassified as type II on the Glogau scale (dynamic wrinkles with moderate aging), and on the GAIS scale, achieved an obvious improvement in the initial condition's appearance, but a touch-up or retreatment is recommended (score 1) (Figure 1-f and 1-g).

Figure 1-a: Initial frontal aspect of the patient.



Figure 1-b: PDO thread insertion.



Figure 1-c: Patient after the PDO thread application and the first PRF session.



Figure 1-d: The patient 20 days after the initial application. We conducted the second session on this day.



Figure 1-e: The patient 23 days after the second application. We performed the third application on this day.



Figure 1-f: The patient on 08/12/2022. 41 days after the third (and final) application of liquid A-PRF.



Figure 1-g: Before beginning the procedures and 85 days after the start of the procedures.

DISCUSSION

Studies indicate that females manifest higher dissatisfaction with their appearance, attributed to societal pressures to conform to beauty standards.

Calcium hydroxyapatite and poly-L-lactic acid are extensively utilized for mid-face volume restoration; nevertheless, their application for Tear Trough deformity correction is discouraged due to limited precision and increased risk of complications.

Hyaluronic acid fillers may also be contraindicated in the infraorbital region due to potential undesirable effects, including the "Tyndall effect" and the formation of cutaneous nodules.

In contrast, Platelet-Rich Fibrin (PRF) offers supraphysiological concentrations of growth factors, fostering a natural healing process without evoking foreign body reactions. Additionally, smooth PDO threads are recommended for collagen stimulation and furrow structuring.

Thus, the combination of smooth PDO threads and liquid A-PRF amplifies the outcomes, representing a promising therapeutic choice. PRF elicits the release of growth factors for a period of 7 to 14 days, whereas PDO threads persist within the organism for approximately 8 months. Consequently, the synergistic effect of these two techniques delivers immediate results through PRF and long-term benefits owing to PDO threads.

CONCLUSION

The clinical aspect obtained through bioestimulation of the infraorbital region with PRF and PDO threads resulted in improved skin laxity and reduced depth of the nasojugal sulcus, leading to rejuvenation and tissue repositioning. This indicates that the combined technique can be recommended for the rejuvenation and tissue repositioning of the infraorbital region.

REFERENCES

1. ARCHANGELO, F.; SOUZA, C. Bioestimulação tecidual associando iPRF e fios de PDO em correção de cicatriz de fissura nasolabial. *Aesthetic Orofacial Science*, Porto Alegre, v. 2, n. 02, set. 2021. Disponível em: <https://ahof.emuemv.com.br/ahof/article/view/64/69>. Acesso em 30 nov.2022.
2. BERTOSSI, D. et al. Effectiveness, longevity, and complications of facelift by barbed suture insertion. *Aesthetic surgery journal*, v. 39, n. 3, p. 241-247, 2019.
3. DOHAN, David M. et al. Platelet-rich fibrin (PRF): a second-generation platelet concentrate. Part II: platelet-related biologic features. *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, v. 101, n. 3, 2006, p. e45-e50.
4. GLOGAU, Richard G. Aesthetic and anatomic analysis of the aging skin. In: *Seminars in cutaneous medicine and surgery*, 1996, p. 134-138.
5. LUO, Sai et al. Correction of the tear trough deformity and concomitant infraorbital hollows with extracellular matrix/stromal vascular fraction gel. *Dermatologic Surgery*, v. 46, n. 12, p. e118-e125, 2020.
6. MIRON, R.; CHOUKROUN, J. Fibrina Rica em Plaquetas na Odontologia e Medicina Regenerativa e Estética. 1 ed. São Paulo: Quintessence Editora, 2018.
7. MONTES, José R. Volumetric considerations for lower eyelid and midface rejuvenation. *Current Opinion in Ophthalmology*, v. 23, n. 5, 2012, p. 443-449.
8. MOON, H.J. Injection rhinoplasty using filler. *Facial Plastic Surgery Clinics*, v. 26, n. 3, p. 323-330, 2018.
9. NACOPOULOS, C.; VESALA, A. Lower facial regeneration with a combination of platelet-rich fibrin liquid matrices based on the low speed centrifugation concept-Cleopatra technique. *Journal of Cosmetic Dermatology*, v. 19, n. 1, 2020, p. 185-189.
10. NOGUEIRA, Patrícia. *Estética Médica Facial 2: aspectos teóricos e práticos*. 1 ed. Belo Horizonte: Face Academy, 2019.
11. PALERMO, Eliandre. Anatomia da região peri-orbital. *Surgical & Cosmetic Dermatology*, Rio de Janeiro, v. 5, n. 3, 2013, p. 245 - 256.
12. RADLANSKI, R.; WESKER, K. A face: atlas ilustrado de anatomia. 2. ed. São Paulo: Quintessence Editora, 2016.
13. SILVA, C.; CEZARETTI, T. O uso de PRP e PRF em procedimentos estéticos minimizando o envelhecimento cutâneo. 2022. 18f. Trabalho de conclusão de curso - Universidade Anhembi Morumbi, São Paulo.
14. SILVA, D.; LOPES, M.; VELOSO, P. O USO DOS FIOS ABSORVÍVEIS DE POLIDIOXANONA (PDO) NO TRATAMENTO DA FLACIDEZ PERIORBITAL. *Revista Ibero-Americana de Humanidades, Ciências e Educação*, v. 8, n. 11, p. 2567-2578, 2022.
15. TAMURA, Bhertha M. Anatomia da face aplicada aos preenchimentos e à toxina botulínica-Parte I. *Surgical & Cosmetic Dermatology*, v. 2, n. 3, p. 195-202, 2010.
16. TAN, Marietta; KONTIS, Theda C. Midface volumization with injectable fillers. *Facial Plastic Surgery Clinics*, v. 23, n. 2, 2015, p. 233-242.
17. TEDESCO, Andrea. et al. Harmonização facial: a nova face da odontologia. 1. ed. Nova Odessa: Napoleão Editora, 2019.