

# DermaI fillers as trends in non-invasive plastic surgery

## Preenchimentos dérmicos como tendências na cirurgia plástica não invasiva

### Rellenos dérmicos: tendencia en cirugía plástica no invasiva

Maria Fernanda Borges de Brito<sup>1</sup>, Pedro Henrique Lessa de Oliveira<sup>2</sup>, Milena de Campos Miranda<sup>3</sup>, Ana Luiza Naujorks Zimmer<sup>4</sup>, Sâmella Soares Oliveira Medeiros<sup>5</sup>, Lara Peres Leão<sup>6</sup>, Nayara Alves de Freitas Lemos<sup>7</sup>

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1. Universidade Federal de Goiás.  
<https://orcid.org/0009-0001-9179-5659>

2. Universidade Federal de Goiás.  
<https://orcid.org/0009-0000-4804-4617>

3. Universidade Federal de Goiás.  
<https://orcid.org/0009-0009-8932-1209>

4. Universidade Federal de Goiás  
<https://orcid.org/0000-0001-8055-9821>

5. Centro Universitário Alfredo Nasser.  
<https://orcid.org/0009-0005-0371-3094>

6. Universidade Federal de Goiás.  
<https://orcid.org/0009-0005-8481-0469>

7. Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás.  
<https://orcid.org/0000-0002-3252-8120>

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#### RESUMO

**Objetivo:** Os preenchedores dérmicos consolidaram-se como técnica minimamente invasiva para aprimoramento estético, oferecendo rejuvenescimento eficaz, seguro e de rápida recuperação. Este estudo realizou revisão sistemática nas bases PubMed e SciELO (2014-2024), incluindo 10 artigos. Os resultados mostraram alta satisfação dos pacientes e novas possibilidades, embora complicações reforcem a necessidade de aplicação por profissionais capacitados. Conclui-se que os preenchedores representam alternativa eficaz às cirurgias tradicionais com tendência de crescimento contínuo e exponencial, principalmente pela personalização dos tratamentos e busca de melhorias dos métodos previamente conhecidos.

**Palavras-chave:** Abrasão química; Compostos Fenólicos; Rejuvenescimento.

#### ABSTRACT

**Objective:** Dermal fillers have established themselves as a minimally invasive technique for aesthetic enhancement, offering effective, safe, and rapid recovery rejuvenation. This study conducted a systematic review of PubMed and SciELO databases (2014-2024), including 10 articles. The results showed high patient satisfaction and new possibilities, although complications reinforce the need for application by trained professionals. The conclusion is that fillers represent an effective alternative to traditional surgeries, with a trend toward continuous and exponential growth, primarily due to the personalized treatment and the pursuit of improvements to previously known methods

**Keywords:** Chemical abrasion; Phenolic compounds; Rejuvenation

#### RESUMEN

**Objetivo:** Los rellenos dérmicos se han consolidado como una técnica mínimamente invasiva para la mejora estética, ofreciendo un rejuvenecimiento eficaz, seguro y de rápida recuperación. Este estudio realizó una revisión sistemática de las bases de datos PubMed y SciELO (2014-2024), incluyendo 10 artículos. Los resultados mostraron una alta satisfacción del paciente y nuevas posibilidades, aunque las complicaciones refuerzan la necesidad de su aplicación por parte de profesionales capacitados. La conclusión es que los rellenos representan una alternativa eficaz a las cirugías tradicionales, con una tendencia de crecimiento continuo y exponencial, principalmente debido al tratamiento personalizado y a la búsqueda de mejoras en los métodos existentes.

**Descriptores:** Abrasión química; Compuestos Fenólicos; Rejuvenecimiento

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## Introduction

Minimally invasive cosmetic surgery (MICS) has gained ground in modern society, primarily with dermal fillers and laser treatments.<sup>1</sup> Currently, there is a range of biochemical materials included in this classification of dermal fillers, such as hyaluronic acid and botulinum toxin, which are the preferred treatment options for facial aging, as they deliver smooth and harmonious aesthetic results, in addition to using a minimally invasive technique and products with long-lasting aesthetic effects.<sup>2</sup>

This article will address dermal fillers as a trend in non-invasive aesthetic approaches, discussing their types, indications, advantages, and disadvantages in relation to traditional plastic surgery. It will also present the scientific evidence supporting the use of these minimally invasive technologies, as well as future perspectives on this evolution and how this improvement assists in the current practice of plastic surgery. An in-depth analysis of these aspects is fundamental to improving recent dermal filler techniques and using them to the benefit of patients in achieving aesthetic results.

## Objectives

To analyze current trends in the use of dermal fillers as a non-invasive procedure in plastic surgery, identifying the main types of substances used, their aesthetic and functional indications, and evaluating the advantages and disadvantages compared to traditional surgical techniques.

## Method

This research constituted a systematic review of the literature, with the purpose of studying contemporary trends and aesthetic results of dermal fillers as a non-invasive procedure in plastic surgery. The formulation of the central question was based on the PICO strategy, considering the elements Population (patients undergoing aesthetic procedures), Intervention (dermal fillers), Comparison (other facial rejuvenation methods) and Result (aesthetic satisfaction, safety and complications). Thus, the central problem of the question was structured as: "What is the current situation of dermal fillers as the preferred technique for non-surgical facial rejuvenation?".

The literature search was conducted using the PubMed and SciELO databases, employing the following English descriptors: "dermal fillers", "non-invasive procedures", "facial rejuvenation", "hyaluronic acid", "aesthetic outcomes", and "complications". These descriptors were combined with the intention of including the main aspects of the topic. The publication period was limited to 2014 to 2024. The initial search yielded 980 articles in PubMed and 32 articles in SciELO, totaling 1,012 publications. After applying the inclusion criteria – full articles in English or Portuguese, peer-reviewed, that specifically addressed dermal fillers as a technique in facial rejuvenation – 998 articles were selected for

screening. In the first selection stage, with the review of titles and abstracts, 720 articles were excluded for not fitting the focus of the study. The remaining 278 articles were selected for full review. Of these, 15 were excluded, either due to duplication or methodological inconsistencies, leaving 263 for detailed analysis. At the end of the process, only 10 studies met all eligibility criteria and provided relevant data on the limitations, applications, results, and complications of non-invasive dermal fillers.

The selected studies revealed that dermal fillers in general, and hyaluronic acid-based dermal fillers in particular, have become predominant procedures in non-invasive facial rejuvenation. Research has revealed high patient satisfaction with aesthetic results, especially when combined with other minimally invasive techniques. However, potential complications have also been documented, highlighting the importance of proper technique and detailed anatomical knowledge by practitioners.

**Table I** - Main findings of the studies included in the systematic review on dermal fillers

Author(s)	Year	Main Finding
Cazzato V, Ellis C, Makris S	2024	Dermal fillers improve the aesthetic perception of one's own face and positively influence facial recognition, increasing personal satisfaction with appearance.
Shome D, van der Hulst RRWJ, Kumar V, Booi DI, et al.	2023	There has been significant growth in the demand for aesthetic facial procedures in India, particularly for non-invasive techniques such as dermal fillers, driven by cultural shifts and technological advancements.
Miotti G, Zeppieri M, Pederzani G, Salati C, et al.	2023	Evolution of blepharoplasty with the integration of minimally invasive techniques, including dermal fillers, for periorbital rejuvenation with shorter recovery time.
Liu Y, Mao R, Xiao M, Zhu W, et al.	2024	A global review showed a significant increase in non-invasive dermatological procedures in the last decade, with hyaluronic acid being one of the most widely used for facial rejuvenation.
Liao ZF, Yang W, Li X, Wang SW, et al.	2024	The combination of thread lifting and injection of non-crosslinked hyaluronic acid in the infraorbital region provided lasting and natural aesthetic improvement, with a low rate of complications.
Basora JF, Fernandez R, Gonzalez M, Adorno J	2014	Case report of diffuse alveolar hemorrhage after hyaluronic acid filler injection; highlights the need for attention to rare and potentially serious adverse events.
Rauso R, Nicoletti GF, Zerbinati N, Lo Giudice G, et al.	2020	Review of complications from unsupervised use of hyaluronic acid highlighting risks of tissue necrosis and infections; reinforces the importance of application by qualified professionals.

<b>Babikir IH, Aloufi TS, Alyahyawi RK, Alarabi FR, et al.</b>	2024	A study in Saudi Arabia showed good acceptance of cosmetic procedures, but revealed significant lack of knowledge about the risks of complications.
<b>Liew S, Wu WT, Chan HH, Ho WW, et al.</b>	2016	Asian consensus indicates that beauty preferences in Asia drive the adoption of dermal fillers, emphasizing facial harmony and subtle results.
<b>Fabi S, Alexiades M, Chatrath V, Colucci L, et al.</b>	2022	A global survey of doctors and patients revealed partial alignment in aesthetic priorities; dermal fillers are valued for the naturalness of the results.

**Source:** Developed by researchers, 2025.

## Discussion

Facial aging is a natural process that occurs primarily due to the loss of collagen and elastin and changes in muscle function.<sup>3</sup> However, it is common to see improvements in techniques to minimize the effects of this event. Thus, techniques such as fillers are on the rise.<sup>4</sup> In the Indian context, for example, there has been a significant increase in facial plastic surgeries, particularly those involving hyaluronic acid fillers and botulinum toxin.<sup>5</sup> The pursuit of beauty is influenced by customs, traditions, and trends, and the desire to improve facial aesthetics is observed in various cultures.<sup>6</sup>

Fillers, which are standardized, repeatable, and in some cases reversible procedures, can be classified in several ways: according to the composition of the material used, the duration of the cosmetic benefit, and reversibility.<sup>7</sup> Thus, these procedures modify how the patient recognizes themselves in the world. A study developed exposed participants to images that mixed the patient's face with faces that had undergone dermal fillers, demonstrating a modification of the perceptual threshold (PSE) of self-recognition, that is, the participants identified digitally corrected versions as “their” face.<sup>9</sup>

In this sense, the increased demand for rejuvenation of the upper third of the face and the periocular region has made non-surgical blepharoplasty with the use of dermal fillers an excellent option. They have also become an alternative to surgical procedures for aesthetic and functional indications, such as upper and lower blepharoplasty, lagophthalmos, and upper and lower eyelid retraction.<sup>7</sup> Dermal fillers should be carefully analyzed before being indicated, as they can cause complications, which raises concerns about the safety of this easily accessible product.<sup>10</sup> In this sense, there is a wide availability of hyaluronic acid fillers that culminate in unreported self-injection, which can generate serious complications.<sup>11</sup>

Therefore, the Ministry of Health and regulatory bodies should restrict prescriptions to physicians only, in order to contain the underreported phenomenon of self-injection. Furthermore, professionals should be aware of the misuse of these dermal fillers and the potential risk of complications such as swelling, bruising, rash, subcutaneous blood accumulation, infection, and alveolar

hemorrhage.<sup>12</sup> Therefore, patient education should be improved to emphasize the preventive rather than corrective potential of non-invasive aesthetic treatments.<sup>8</sup>

## **Final Considerations**

Dermal fillers have established themselves as central tools in non-invasive plastic surgery, characterized by consistent aesthetic results, the possibility of reversibility in some cases and high patient satisfaction rates. The review showed that, especially hyaluronic acid-based products, have a favorable safety profile and great clinical versatility, constituting an effective alternative to traditional surgical techniques, especially in facial rejuvenation and in the treatment of periorcular changes. Sodium deoxycholate has also been shown to be promising, particularly in reducing eyelid bags and localized fat deposits, expanding the therapeutic scope of dermal fillers and offering new possibilities for non-surgical treatment.

However, even though minimally invasive, these procedures are not without risks. Reported complications range from mild reactions to serious adverse events and reinforce the need for careful analysis, proper indication, and professional training for their application. Future prospects indicate advances in the personalization of techniques, the development of materials with greater biocompatibility, and safer protocols. Thus, the trend is towards strengthening this practice, expanding its role in plastic surgery procedures.

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**Correspondent author:**

Maria Fernanda Borges de Brito  
Rua 235, s/n, Setor Leste Universitário, CEP 74605-050.  
Goiânia, Goiás, Brasil,  
maria.borges23@discente.ufg.br