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# COMPARISON BETWEEN AUTOLOGOUS FAT GRAFTING AND SYNTHETIC FILLERS IN FACIAL REJUVENATION: A CRITICAL REVIEW OF THE EFFICACY, SAFETY, AND DURABILITY OF RESULTS

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**Abstract:** Introduction: Volume loss is one of the main determinants of facial aging. Among the minimally invasive strategies for volume restoration, autologous fat grafting and synthetic fillers, especially hyaluronic acid, stand out. Despite their widespread clinical use, controversies persist regarding the durability, predictability, and complication profile of each technique. Objective: To critically compare the efficacy, safety, and durability of results between fat grafting and synthetic fillers in facial rejuvenation. Methods: Structured narrative review of the literature, including clinical studies, case series, comparative trials, and systematic reviews published between 2005 and 2025 in the PubMed/MEDLINE, Scopus, and Web of Science databases. Outcomes related to volume maintenance, patient satisfaction, resorption rates, complications, and the need for retreatment were analyzed. Results: Fat grafting showed greater long-term durability, with variable initial resorption but volumetric stability after six to twelve months. Synthetic fillers demonstrated high immediate predictability, but with progressive degradation and the need for periodic reapplication. The safety profile was favorable in both techniques, with different types of complications. Conclusion: Both approaches are effective and complementary. Fat grafting is more suitable for extensive volumetric restoration and long-lasting results, while synthetic fillers remain ideal for localized corrections and fine adjustments, with less invasiveness.

**Keywords:** Facial rejuvenation; fat grafting; dermal fillers; hyaluronic acid; cosmetic plastic surgery.

## Introduction

Facial aging is a multifactorial process involving profound structural changes, including progressive bone resorption, redistribution and atrophy of fat compartments, ligament laxity, and qualitative changes in the skin. These phenomena result in loss of malar projection, deepening of nasolabial folds, formation of dark circles under the eyes, drooping of the fat pads, and alteration of the mandibular contour.

In recent decades, the concept of facial rejuvenation has evolved from an approach focused exclusively on skin repositioning to a three-dimensional strategy of volumetric restoration. In this context, autologous fat grafting and synthetic fillers have become fundamental pillars of minimally invasive techniques.

Fat grafting, or lipofilling, is based on the transfer of autologous adipose tissue harvested by liposuction, processed, and reinjected into specific planes of the face. In addition to acting as a filler material, adipose tissue is rich in mesenchymal stem cells and growth factors, suggesting a possible regenerative effect on skin quality.

On the other hand, synthetic fillers, especially cross-linked hyaluronic acid, offer a widely used alternative, with outpatient application, immediate predictability, and a wide range of products with different degrees of viscosity and elasticity. However, their temporary nature requires periodic reapplication to maintain results.

Despite the widespread use of both techniques, the choice between them remains a subject of debate. Differences in durability, cost, complication profile, and ideal indication are not yet fully understood. Given this, this review aims t ly and critically compare fat grafting and synthetic fillers in facial rejuvenation, emphasizing the efficacy, safety, and sustainability of the results.

## Methodology

A structured narrative review of the literature was conducted. Searches were conducted in the PubMed/MEDLINE, Scopus, and Web of Science databases using the following descriptors: fat grafting, autologous fat transfer, dermal fillers, hyaluronic acid, facial rejuvenation, and their Portuguese equivalents.

### Inclusion criteria:

- Prospective and retrospective clinical studies.
- Direct comparative trials between fat grafting and synthetic fillers.
- Relevant systematic reviews and meta-analyses.
- Studies that evaluated volumetric maintenance, patient satisfaction, and complications.

### Exclusion criteria:

- Isolated case reports.
- Experimental studies without direct clinical correlation.
- Studies without adequate description of outcomes.

The main outcomes analyzed were: resorption rate, volume durability, need for retreatment, local and systemic complications, and satisfaction rates.

## Technical aspects of the techniques

### Autologous fat grafting

The procedure involves three main steps: harvesting, processing, and reinjection. Harvesting is performed by low-pressure liposuction in donor areas such as the abdomen, flanks, or thighs. The aspirated material is then processed by centrifugation, decantation, or filtration to remove free oil, blood, and anesthetics.

Reinjection is performed with blunt cannulas, in multiple tunnels and small volumes, aiming to maximize graft contact with well-vascularized tissues. Graft survival depends on rapid revascularization and minimization of mechanical trauma.

### Synthetic fillers

Hyaluronic acid-based fillers differ in terms of cross-linking degree, concentration, and rheological properties. More cohesive products are indicated for deep planes, while less viscous formulations are used superficially.

The injection technique can be bolus, linear retroinjection, or microdeposits, depending on the region treated. The possibility of reversal with hyaluronidase represents an important advantage in terms of safety.

## Results

### Volumetric maintenance and durability

Longitudinal studies show that fat grafting presents significant initial resorption in the first three to six months, varying

between 20% and 60%. After this period, the remaining volume tends to stabilize and can be maintained for several years. In follow-ups longer than 24 months, durability consistently exceeds that of synthetic fillers.

Hyaluronic acid fillers have predictable maintenance for 6 to 18 months, depending on the product and the treated area. After this period, progressive degradation occurs, with a gradual return of volumetric loss.

### Safety and complications

In fat grafting, the most frequent complications include contour irregularities, asymmetries, formation of oily nodules, and calcifications. Serious complications, such as fat embolization, are rare when safe injection plans are followed.

In synthetic fillers, the most common complications are prolonged edema, bruising, Tyndall effect, and inflammatory nodules. Occlusive vascular events are rare but potentially serious, justifying the importance of anatomical knowledge and the immediate availability of hyaluronidase.

### Patient satisfaction

Most studies show high satisfaction rates for both techniques. Patients who undergo fat grafting tend to value the naturalness and durability of the results, while those treated with fillers highlight the rapid recovery and immediate predictability.

## Discussion

The comparison between fat grafting and synthetic fillers shows that these techniques are not competing but complementary. Fat grafting is particularly advantageous in patients with extensive volume loss, the need for global facial correction, and an interest in long-lasting results. In addition, the regenerative potential of adipose tissue can contribute to improved skin quality.

However, the variability of resorption and the need for possible initial overcorrection represent important limitations. The learning curve is also longer, and the procedure is inherently more invasive.

Synthetic fillers, on the other hand, offer precise volumetric control, shorter procedure time, and immediate recovery. They are ideal for fine adjustments, periorbital regions, and patients who wish to avoid surgical procedures. The main limitation lies in the need for periodic reapplication and the cumulative long-term cost.

Hybrid approaches, combining fat grafting for deep structural restoration and fillers for superficial refinement, are increasingly being adopted as the standard in advanced facial rejuvenation.

## Conclusion

Autologous fat grafting and synthetic fillers are effective, safe, and widely established methods in facial rejuvenation. Fat grafting stands out for its durability and regenerative potential, being indicated for extensive volumetric corrections and long-term strategies. Synthetic fillers remain ideal for localized corrections, immediate predictability, and less invasiveness. Individualized treatment and the combined use of techniques represent the most rational approach in contemporary practice.

## References


Coleman SR. Structural fat grafting: more than a permanent filler. Plast Reconstr Surg. 2006;118(3):108S–120S.

Coleman SR, Saboeiro AP. Fat grafting to the face: a review of technique and outcomes. Plast Reconstr Surg. 2007;120(6):1837–1849.

Gennai A, Lupi F, Raposio E. The use of autologous fat grafting in facial rejuvenation: a systematic review. Aesthetic Plast Surg. 2020;44(2):434–448.

DeLorenzi C. Complications of injectable fillers, part I. Aesthetic Surg J. 2013;33(4):561–575.

Rohrich RJ, Monheit G, Nguyen AT, Brown SA. Soft-tissue filler complications: the important role of biofilms. Plast Reconstr Surg. 2010;125(4):1250–1256.

Atiyeh BS, Costagliola M, Hayek SN. Fat grafting in cosmetic surgery: principles, applications, and complications. Aesthetic Plast Surg. 2014;38(4):559–575.

Sundaram H, Cassuto D. Biophysical characteristics of hyaluronic acid soft-tissue fillers and their relevance to aesthetic applications. Plast Reconstr Surg. 2013;132(4S-2):5S–21S.

Khouri RK et al. Diffusion and perfusion: the keys to fat grafting. Plast Reconstr Surg. 2014;133(5):1079–1088.

Beleznay K, Carruthers JD, Humphrey S, Jones D. Avoiding and treating blindness from fillers: a review of the world literature. Dermatol Surg. 2015;41(10):1097–1117.

Liew S, Wu WTL, Chan HH et al. Consensus on facial volumization with hyaluronic acid fillers. Plast Reconstr Surg. 2016;138(2):1e–20e.