

# Facial Overfilled Syndrome: A Narrative Clinical Review

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**Background:** Facial Overfilled Syndrome (FOS) is an increasingly prevalent iatrogenic complication resulting from the excessive or inappropriate use of dermal fillers. Clinically significant for causing facial distortion and unnatural dynamics, it is frequently compounded by profound psychological distress and aesthetic perception biases.

**Aim:** This narrative clinical review aims to summarize the etiology, clinical features, diagnostic approaches, and management strategies of FOS, establishing a structured framework to emphasize the importance of prevention through anatomical knowledge and individualized treatment planning.

**Methods:** A comprehensive literature search was conducted in PubMed, Google Scholar, and CNKI using keywords such as “facial overfilled syndrome”, “facial overfilling”, “overfilled face” and “dermal filler complications”. Relevant original studies, clinical trials, meta-analyses, and reviews published until October 2025 were included and synthesized into a narrative framework.

**Results:** The pathogenesis of FOS extends beyond mere volumetric excess, driven by a complex triad of anatomical mismatch, biomechanical dysregulation, and the cumulative payload of repeated treatments. Clinical hallmarks include resting distortion and unnatural facial animation. Management must be highly individualized; while targeted, ultrasound-guided hyaluronidase injection remains the established gold standard for hyaluronic acid fillers, evolving adjunctive therapies (eg, recombinant enzymes, energy-based devices, and micro-liposuction) demand strict clinical caution.

**Conclusion:** Addressing FOS requires a clinical paradigm shift from simple volume restoration to precision-driven, layer-specific augmentation. Prevention through patient education and anatomical mastery is paramount. Future research should prioritize elucidating filler degradation kinetics, developing objective 3D assessment tools, and engineering fully reversible biomaterials.

**Keywords:** facial overfilled syndrome, facial overfilling, overfilled face, dermal filler complications

## Introduction

Facial laxity is a multifaceted process that involves changes in the bones, soft tissues, and skin. The direct causes of its occurrence are related to the loss of collagen and elastin in the dermis, decreased stability of the supporting ligaments, weakened support from the superficial musculoaponeurotic system (SMAS), sagging of fat pads, and bone resorption.<sup>1</sup> To combat facial skin laxity, an increasing number of patients opt for non-surgical treatments.<sup>2</sup> Compared to traditional cosmetic surgery, non-surgical methods offer advantages such as more natural results, lower trauma, and shorter recovery time, making them increasingly popular among those seeking aesthetic enhancement.<sup>3</sup>

Non-surgical treatments commonly used in clinical practice for facial skin laxity include radiofrequency therapy, micro-focused ultrasound, and injectable filler treatments. Injectable facial fillers are a popular minimally invasive method for facial rejuvenation.<sup>4</sup> These fillers can be used to restore facial volume, enhance facial features, and reduce wrinkles and fine lines. Almost all areas of the face can be targeted and with significant efficacy.<sup>5-9</sup>

The most commonly used fillers are hyaluronic acid, collagen, and poly-L-lactic acid. Although these fillers are generally considered safe, complications can arise if used in excess. Facial Overfilled Syndrome (FOS) is one of the most

common yet underrecognized complications.<sup>10</sup> Crucially, the clinical presentation of FOS extends far beyond a simple localized volumetric excess; rather, it manifests from a complex interplay of anatomical dysfunctions, aberrant material behaviors, and underlying psychological drivers.

From a structural perspective, FOS disrupts the delicate biomechanical equilibrium of the face's multi-layered architecture.<sup>11–13</sup> This disruption is rooted in three highly synthesized mechanisms: anatomical mismatch, wherein filler volume exceeds local tissue capacity, a threshold frequently compromised by ethnic skeletal variations and inherent physiological skin laxity;<sup>14–16</sup> biomechanical and dynamic dysregulation, which restricts natural muscle excursion, overstretches the skin envelope, and produces unnatural midface protrusion during facial animation due to inaccurate static evaluations;<sup>17–21</sup> and the cumulative payload of repeated interventions, encompassing prolonged filler residency, occult migration, and adverse biological responses like granuloma formation or autologous fat hypertrophy.<sup>16,22–24</sup>

Compounding these physical alterations is a profound psychological component that often serves as the catalyst for overfilling. FOS is frequently perpetuated by an aesthetic perception bias, which inflicts significant psychological distress.<sup>25</sup> Rapid visual adaptation to augmented features, further skewed by distorted social media standards, continually shifts a patient's natural aesthetic baseline, thereby fueling a vicious cycle of inappropriate filler requests.<sup>26–28</sup>

Recognizing these intertwined factors is crucial. Therefore, this narrative review aims to synthesize the etiology, diagnosis, and management of FOS, equipping aesthetic practitioners with clinical framework to promote rational aesthetics and holistic patient care.

## Methods

This narrative review was conducted through comprehensive searches in PubMed, Google Scholar and CNKI using the following keywords: facial overfilled syndrome, facial overfilling, overfilled face, and dermal filler complications. Original research articles, clinical trials, meta-analyses, systematic reviews, and review articles published up to October 2025 were reviewed. Rather than employing systematic inclusion and exclusion criteria, articles were selectively evaluated and included based on their clinical relevance, historical significance, and contribution to the anatomical and psychological conceptual framework of FOS.

## Results

### Definition of FOS

FOS is an adverse event following minimally invasive soft tissue filler injections, typically resulting from excessive use of hyaluronic acid or non-hyaluronic acid fillers in the face, leading to an overly inflated or swollen appearance, and may also cause changes in facial expressions and unnatural volume distribution in the midface.<sup>10,29</sup>

### Symptoms of FOS

FOS is characterized by distorted facial contours and a bulky appearance. Its clinical manifestations are diverse and can potentially lead to functional impairments.<sup>10,16</sup> Specific features may include the “sunset eyes” appearance, “chipmunk cheeks” or “butt cheeks” with a heavy sensation, temporomandibular concavity, “Avatar nose”, “flowerhorn” bulge, “sausage lips” or “duck lips” or downward-turned mouth corners, “taurus philtrum” appearance, “witch's” or “pharaoh's” chin, “pillow face” or “flying saucer face” profile.<sup>10,16,30,31</sup> Patients often exhibit one or more of these characteristics, reflecting changes in facial proportions and a disruption of anatomical harmony.<sup>30</sup> Additionally, excessive filler use tends to decrease aesthetic appeal and distort gender-related perceptions of attractiveness.<sup>25</sup>

### Causes of FOS

The etiology of FOS can be categorized into iatrogenic and physiological factors. Iatrogenic factors primarily include the use of hyaluronic acid injections, autologous fat grafting, collagen fillers, collagen stimulators, permanent polymethylmethacrylate (PMMA) fillers, and exogenous growth factors, all of which have been implicated in the development of FOS.<sup>22,32–34</sup> Conversely, physiological elements may exhibit symptoms akin to those associated with FOS, such as hypertrophy of adipose tissue, age-related modifications, and the gap type. This type is distinguished by a more relaxed

look of both facial and body skin when compared to peers with a normal BMI. Even without any filler injections, a noticeably puffy facial appearance can remain visually apparent.<sup>11,14,15</sup> Additionally, improper choice of injection planes, incorrect types and amounts of fillers, inaccurate assessments by injectors, insufficient professional knowledge, and non-standard techniques and irrational aesthetic preferences are common causes contributing to the occurrence of FOS.<sup>16,17,35–37</sup>

The choice of injection depth is crucial and must be based on the facial anatomical structure, with fillers injected at different layers.<sup>38</sup> Materials including poly-L-lactic acid, polycaprolactone, or hyaluronic acid, when administered superficially in the subcutaneous layer around the eyes, can lead to surface imperfections or noticeable filler outlines.<sup>39</sup> On the other hand, materials such as collagen or non-crosslinked hyaluronic acid, if injected too deeply, might not produce the intended contouring effect. The logic behind the selection of injection sites significantly influences the results of the filling procedure and must take into account both the aesthetic proportions of the face and the dynamics of the muscles.<sup>23</sup>

Facial overfilling may also result from the cumulative effect of previously injected fillers,<sup>40</sup> or from filler migration, biofilm formation, and granulomatous reactions.<sup>24</sup> These substances gather in specific regions, possibly resulting in non-inflammatory nodules that may later cause fibrosis and result in a space-occupying effect.<sup>40</sup> If the fillers used are non-degradable, granulomas may be more pronounced and persist long-term, eventually manifesting as facial overfilling.<sup>41</sup> Traditionally, fillers are thought to degrade within six months to a year, however, recent MRI studies indicate that fillers can remain for up to 27 months.<sup>16</sup> Ultrasound studies also confirm that fillers can still be observed even after more than 7 years of injection and detected inactive granulomas in the superficial orbital rim using ultrasound.<sup>42</sup>

Inexperienced or unskilled practitioners are a significant cause of excessive filler application. Some practitioners perform injection procedures with the aim of counteracting gravity and the aging process by overfilling structures, which can, in fact, lead to ligament deformation and accelerate aging.<sup>10</sup> Facial fillers requires precise control over the dosage, depth, and placement of fillers. Inadequate technique may result in uneven distribution of the filler or excessive volume.<sup>43</sup> Furthermore, some practitioners may neglect the overall facial proportions and dynamic aesthetics, which can lead to an unnatural postoperative appearance.<sup>44</sup>

Many cases of FOS arise from a lack of understanding by practitioners regarding the pathophysiological mechanisms of aging.<sup>35</sup> With advancing age, dynamic and cumulative changes occur in facial tissue structures, including bone resorption, weakening of the anchoring complex, changes in facial muscle behavior, and soft tissue displacement.<sup>15</sup> Notably, the volume of superficial subcutaneous fat in the face increases with age, while the reduction of deep subcutaneous fat volume is limited to the upper third of the fat pads.<sup>15</sup> The anchoring complex, which is formed by fixed ligaments and the reticular alveolar structure connecting the periosteum, progressively weakens with age, leading to soft tissue sagging and displacement, and consequently, the appearance of facial aging signs.<sup>12,45,46</sup>

The adhesion between the SMAS and the deeper plane, emphasizing the importance of anatomical understanding in facial aging.<sup>13</sup> Through the dissection of fresh-frozen cadaveric heads, confirmed that the transverse facial septum formed along the inferior border of the zygomaticus major muscle provides an anatomical explanation for the development of FOS.<sup>17</sup> As the primary muscle responsible for the smiling movement, the zygomaticus major drives the motion of the superficial fat layer and the SMAS. When excessive filler is present within the superficial fat compartment or its deep fibrous layer, it may restrict the muscle's ability to mobilize the oral commissure axis, thereby affecting both the vertical and horizontal movement of the mouth corner toward the zygomatic arch. This restriction may underlie patients' subjective perception of an unnatural smile.<sup>47–49</sup> The nasofrontal ligament extends from the periosteal layer to the dermal layer of the nasal dorsum, contributing to the formation of the "Avatar nose".<sup>50</sup> Research indicates that performing a subincision on this ligament can enhance filler stability and improve aesthetic outcomes.<sup>50</sup> Furthermore, due to larger adipose lobules and the presence of parallel septa, females have relatively reduced resistance to skin stretching. Consequently, traction can exacerbate skin laxity, and excessive filler injection may further decrease skin elasticity.<sup>18</sup>

Filler treatments are typically performed while the face is at rest, without the involvement of facial expressions, while the assessment of treatment outcomes may be misleading, potentially leading to the FOS.<sup>19–21</sup> One explanatory model indicates that while smiling, the fat compartments in the midface, along with the injected substance, protrude forward.

When an excessive amount of filler is administered, this forward shift is amplified during smiling or other facial expressions, resulting in an appearance of the midface that seems excessively enhanced and out of proportion, which thus plays a role in the emergence of FOS.<sup>19–21</sup>

The insufficient understanding of skeletal structures and soft tissue distribution across different ethnicities is one of the major contributing factors to the development of FOS.<sup>16</sup> FOS tends to be more pronounced among East Asian individuals, primarily due to their distinct facial skeletal and anatomical characteristics, featuring notable zygomatic arches, protruding maxilla, and a comparatively lower axis of the oral commissure, which collectively enhance the width of the mid-facial area in contrast to other ethnicities.<sup>16</sup> Aesthetic perception bias is another important contributing factor. When patients repeatedly exposed to overly plumped, distorted lip shapes or facial features, their aesthetic perception gradually shifts in that direction, leading them to seek facial contours that deviate from natural proportions.<sup>26,27,51,52</sup>

## Classification of FOS

There is currently no established classification system for FOS. However, it can be categorized according to clinical manifestations and the type of filler material used (Table 1).

Kapoor proposed the Kapoor's Classification by analyzing anatomical location, injection depth, filler characteristics, clinical features, and common patient complaints (Table 1). Patients may evolve from one subtype to another over time due to cumulative filler exposure, anatomical alterations, and fibrotic remodeling.<sup>53</sup>

## Diagnosis of FOS

The diagnosis rate of FOS is very low. When an individual's face frequently presents with extreme puffiness, visual adaptation occurs.<sup>28</sup> Its diagnosis is primarily made through physical examination of the patient's face and the distribution of the filler is assessed for confirmation.<sup>10</sup> It is essential to determine whether the volume of the affected facial area is caused by endogenous fat tissue or by injected dermal fillers.<sup>60</sup> Furthermore, patients often have a history of dermal filler injections.<sup>10,29</sup> Marginal FOS can be suspected by palpating the filled areas with the thumb and index finger to

**Table 1** Proposed Classification and Mechanisms of Facial Overfilled Syndrome

Classification Criteria	Clinical Subtype	Underlying Mechanisms
Clinical presentation	Dynamic dysregulation <sup>54</sup>	Fillers impair facial muscle function. Predominantly occurs in regions with dense expression muscles (eg, nasolabial folds, glabellar area).
	Static overload <sup>55</sup>	Filler dosage exceeds tissue accommodative capacity. Commonly observed in areas with lower tissue elasticity (eg, forehead, temporal regions), presenting as abnormal resting bulges.
Type of filler material	Hyaluronic acid <sup>56</sup>	Repeated, excessive injections. Hydrophilicity may lead to increased volume at the injection site.
	Calcium hydroxylapatite <sup>57</sup>	Deposition of fibrin, fibroblasts, and macrophages after injection may trigger a chronic foreign body reaction resulting in localized volume abnormalities.
	Polycaprolactone <sup>58</sup>	May exacerbate tissue fibrosis due to collagen induction.
	Poly-L-lactic acid <sup>59</sup>	Post-injection inflammatory responses promote local volume enlargement.
	Autologous fat <sup>22</sup>	Inherent metabolic activity of living adipose tissue leads to unpredictable volumetric fluctuations (eg, hypertrophy corresponding with systemic weight gain).
	Kapoor's Classification <sup>53</sup>	Focal superficial overfilling
Global superficial overfilling		Frequent use of "skin enhancers" or hydrating fillers without adequate volumetric assessment.
Deep volume overfilling		Extensive injection of high G' fillers to enhance structural effects, without considering their long-term residual properties.
Myomodulatory overfilling		Intentionally or unintentionally placement of highly elastic or large-volume fillers over facial muscles, mimicking neuromodulatory functions.
	Chronic layered overfilling	Low-grade inflammation, product migration, and long-term filler accumulation leading to fibrotic remodeling.

assess the mobility of the subcutaneous substance.<sup>30</sup> The infraorbital medial region is the easiest area to identify, as it is typically the thinnest area of facial skin with the least fat.<sup>30</sup>

In certain cases, imaging modalities such as ultrasonography, magnetic resonance imaging (MRI), or computed tomography (CT) can be employed to evaluate the distribution of dermal fillers: on ultrasonography, hyaluronic acid typically appears as a hypoechoic (dark) cystic area, whereas calcium hydroxylapatite products present as hyperechoic (bright) cystic or linear structures.<sup>29,61</sup> Hydrophilic fillers are generally hypoechoic or anechoic on ultrasonography,<sup>62</sup> while hydrophobic fillers exhibit hyperechoic patterns.<sup>63</sup> Regenerative materials may demonstrate variable echogenicity, with or without enhancement, and heterogeneous internal echoes can be observed within the surrounding tissue.<sup>61</sup> Autologous fat grafts usually appear as isoechoic or heterogeneously hypoechoic regions.<sup>61</sup> In MRI imaging, the signal intensity of hyaluronic acid is similar to that of water,<sup>64</sup> with fat and filler can be recognized as distinct entities.<sup>65</sup> Calcium hydroxylapatite shows an intermediate to low signal intensity, while collagen-based fillers present a low signal intensity on T1-weighted images and a high signal intensity on T2-weighted images.<sup>66</sup>

At present, the evaluation of FOS does not have objective quantitative standards. Subsequent studies ought to prioritize the creation of facial aesthetic assessment tools utilizing artificial intelligence or 3D imaging technologies. These tools should accurately gauge both the volume and distribution of filler materials, along with their effects on the contours of the face.<sup>67</sup>

## Treatment of FOS

The treatment plan for FOS should be tailored according to its severity and the individual goals of the patient. For mild cases patients may opt to refrain from further injections, complemented by skin tightening treatments to prevent sagging.<sup>10</sup> Gentle massage helps promote even distribution of the filler and reduces localized accumulation, while therapies such as radiofrequency or ultrasound can induce degradation of the filler to accelerate its metabolism, stimulate collagen regeneration, improve skin texture and mild overcorrection may be combined.<sup>22,35</sup> In more severe cases, active removal of the filler is required, with the primary method being hyaluronidase injection.<sup>10</sup> For non-biodegradable fillers, needle puncture and compression techniques, or surgical excision may be necessary, alongside oral antibiotics and corticosteroid treatment.<sup>35</sup> If the filler has caused significant damage to facial tissues, adjunctive treatments such as chemical peels or lasers may also be needed to improve skin appearance.<sup>10</sup>

Hyaluronidase is the preferred method for dissolving hyaluronic acid-based fillers.<sup>68</sup> During the dissolution procedure, injections should be made at multiple depths and angles.<sup>10</sup> In most cases, multiple injections are required to achieve a noticeable correction. The longer the filler remains in the tissue and the higher its degree of crosslinking, the more difficult it becomes to dissolve, requiring a greater amount of enzyme.<sup>10</sup> This enzyme not only degrades hyaluronic acid but also promotes fibrinolysis when other substances are involved, helping to alleviate inflammation and fibrosis associated with foreign body injections.<sup>69</sup> To improve treatment precision, targeted dissolution of the filler material can be performed under real-time ultrasound guidance.<sup>29</sup>

Utilizing a novel combination of hyaluronidase, collagenase, and lipase can improved issues related to edema, fibrosis, and fluid retention in patients receiving dermal fillers,<sup>70</sup> aligning with the latest advancements in enzyme therapy, where the combination of collagenase, hyaluronidase, and lipase has shown to improve fibrotic responses.<sup>71–73</sup> However, it is important to critically note that the current literature lacks robust, large-scale randomized controlled trials to establish the efficacy, safety, and standardized dosing protocols of these recombinant enzyme therapies for FOS. Therefore, their application should remain cautious and empirically guided.

Extracorporeal shockwave therapy, as a non-invasive physical treatment modality, its mechanisms of action include promoting tissue regeneration, alleviating inflammatory responses, and accelerating metabolism. By modulating energy levels and shockwave frequency, it can precisely target the affected tissues, thereby improving facial contours and reducing the hardness of nodules.<sup>74</sup> Additionally, significant improvements in skin laxity are observed, as well as an upward shift in the corner of the mouth during Duchenne's smile.<sup>74</sup> While theoretically promising, its precise mechanism in filler degradation remains largely speculative, and long-term efficacy data are currently insufficient, positioning it as an adjunctive rather than a primary therapy.

Excessive facial fat filling is challenging to repair due to the difficulty in distinguishing it from normal tissue on imaging, as the fat integrates with the surrounding tissue, and the treatment options are extremely limited.<sup>22</sup> Low Negative Pressure Combined With Supertumescence (LNPST) for micro-liposuction can repair autologous fat-induced FOS with satisfactory outcomes and few complications.<sup>22</sup> This technique allows for precise and direct removal of excess fat from the target layer and offers significant advantages when addressing multi-regional or large-volume FOS cases. Some practitioners prefer using micro-liposuction or surgical contouring to remove excess fat and the two techniques often being combined.<sup>75</sup> It is important to note that laser lipolysis may cause significant energy deposition in localized areas, leading to high temperatures that could damage deep blood vessels and nerves.<sup>76</sup>

In the process of repairing FOS, it is crucial not only to reduce tissue redundancy but also to simultaneously tighten the expanded skin to prevent further sagging. A variety of energy-based devices (EBDs) have been employed for this purpose, including plasma radiofrequency, bipolar radiofrequency, lasers, and ultrasound.<sup>77–79</sup> Specifically, Devices like plasma radiofrequency-assisted liposuction, laser-assisted liposuction, and radiofrequency-assisted liposuction work by not only removing subcutaneous fat but also heating the soft tissue, which leads to tissue contraction and significantly enhances skin laxity due to the decrease in fat volume.<sup>77–79</sup> Ni et al utilized plasma radiofrequency-assisted microsuction (PRFAMS) to treat FOS patients, postoperative results showed that all patients were satisfied with the treatment.<sup>80</sup> The advantage of this technique lies in its ability to simultaneously remove subcutaneous fat and biofilm formed by various fillers, while achieving subcutaneous space narrowing and skin tightening through instantaneous heating of the subcutaneous fibrous septal network.<sup>80</sup> Micro-focused ultrasound technology employs ultrasonic energy to elevate the temperature of the dermis, the layer of superficial fat, and the SMAS fascia, leading to collagen denaturation, contraction, proliferation, and remodeling, which results in a tightening and firming effect.<sup>81</sup> EBDs offer the theoretical advantage of synergistic skin tightening following volume reduction, intense thermal energy deposition may paradoxically exacerbate inflammatory granulomatous reactions or cause unpredictable degradation of residual materials. Therefore, the use of EBDs in FOS management is not yet a standardized protocol, patient selection and energy parameters must be highly individualized.

As a biodegradable filler, Poly-L-lactic acid mitigates problems associated with surplus filling by encouraging collagen synthesis and remodeling, thereby facilitating the development of new collagen fibers that gradually supplant the excessive filler.<sup>82</sup>

## Prevention of FOS

The best approach to prevent FOS is to gain an in-depth understanding of facial anatomy, elucidate the role of various tissue structures in the aging process, and comprehend the mechanisms of facial tissue aging.<sup>10</sup>

In terms of injection techniques, hyaluronic acid injection in the temporal region under ultrasound guidance can effectively avoid blood vessels, ensuring precise delivery to the targeted anatomical layers.<sup>83</sup> Dynamic filling can help prevent adverse events during soft tissue filler injections, as indicated by the maximum anterior projection point during a smile using three-dimensional surface scanning.<sup>17</sup> To avoid the diffusion of fillers on both sides or the development of an “Avatar nose”, absorbable sutures, known as “volumizing threads”, can be utilized alongside fillers.<sup>84</sup>

During the procedure, the practitioner should use a layered injection technique, targeting different tissue planes in the face to ensure even distribution of the filler material.<sup>85</sup> Furthermore, prior to injection, the type and volume of the filler, as well as the injection depth and precise injection points, should be clearly defined.<sup>86–89</sup> Injection technique and dosage should be adjusted according to the characteristics of the chosen material and avoid overfilling in a single treatment session is necessary.<sup>90</sup> It is commonly believed that midfacial hollowness is related to the depletion of the orbital fat pad beneath the orbicularis oculi muscle.<sup>91</sup> In normal adults, the volume of this fat pad is approximately 2 to 3 mL, with only 0.02 to 0.06 mL of filler required annually to maintain its volume.<sup>10</sup>

Before injection, a personalized assessment and treatment plan should be developed, which includes evaluating muscle function, observing facial movements during injection.<sup>16</sup> Additionally, factors such as skeletal structure, soft tissue distribution, symmetry, skin elasticity, signs of aging, gender, ethnicity, cultural preferences, and whether the approach targets specific areas or adopts a global perspective must be comprehensively considered.<sup>88</sup>

Health education for patients is key to the prevention and management of FOS. Practitioners must engage in thorough communication with patients before treatment, outlining the limitations of filler treatments and emphasizing the goal of achieving natural beauty.<sup>27</sup> Experienced practitioners should exercise professional judgment, promptly halting any requests for more fillers.<sup>87</sup>

In superficial injections, fillers are more sensitive to external shear forces and pressure: shear forces are crucial for resisting skin layer displacement caused by muscle movements, while pressure represents the resistance to dynamic or static compression.<sup>92</sup> In facial injections, selecting products that consider these forces is important to prevent the occurrence of FOS. Additionally, special attention should be given to the pressure exerted by the filler and the risk of migration, particularly in high-pressure areas, it is advisable to consider alternative approaches, such as energy-based devices or polymer reinforcement of facial ligaments, to reduce the volume of filler used.<sup>16</sup> Treatment should not rely solely on dermal fillers but should include complementary methods such as botulinum toxin, energy-based devices, or tissue-tightening techniques, tailored to the individual needs of the patient.<sup>60</sup>

Future studies ought to concentrate on creating innovative filler materials, including those that possess reversible characteristics and improved biocompatibility.<sup>93,94</sup> Furthermore, investigations should examine supplementary degradation methods to facilitate quick and secure solutions for instances of overfilling.<sup>93,95</sup>

## Conclusions

Facial Overfilled Syndrome (FOS) represents a multifaceted iatrogenic challenge, driven not merely by localized volumetric excess, but by a complex triad of anatomical mismatch, biomechanical dysregulation, and psychological aesthetic perception bias. Consequently, the clinical treatment of facial rejuvenation must shift from simple volume restoration to precision-driven, layer-specific augmentation that respects facial dynamics and individual constraints.

For diagnosed FOS, management must be critically individualized, prioritizing evidence-based targeted dissolution with hyaluronidase for hyaluronic acid fillers, while exercising strict clinical caution when employing evolving adjunctive therapies such as recombinant enzymes, energy-based devices, or micro-liposuction. Ultimately, prevention through comprehensive doctor-patient education and rational aesthetic planning remains the fundamental approach.

To systematically handle this increasingly prevalent complication, future research must prioritize elucidating the long-term degradation kinetics of dermal fillers, developing objective artificial intelligence or 3D imaging technologies, and engineering fully reversible biomaterials.

## Disclosure

The authors report no conflicts of interest in this work.

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