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Short Communication
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Restoring Facial Volume and Skin Quality after GLP-1 Receptor Agonist-Induced Weight Loss: A Multi-Level Regenerative Approach

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Abstract

Background: Expanding use of GLP-1 Receptor Agonists (GLP-1RAs) for weight management has created a growing cohort of patients presenting with characteristic facial changes termed 'GLP-1 face', encompassing volume deflation, skin laxity, dermal thinning, and epidermal barrier compromise.

Case Presentation: A woman in her early forties presented with progressive facial deterioration after eight months of tirzepatide therapy (5 mg weekly), having lost approximately 12.7 kg. Clinical findings included temporal hollowing, midfacial deflation, jawline laxity, dehydration, rosacea-associated erythema, and barrier dysfunction. A three-month multi-level protocol was implemented comprising PEG-crosslinked Hyaluronic Acid (HA) with Calcium Hydroxyapatite (CaHA) filler, cohesive HA filler, broadband infrared thermolifting (750 nm - 1800 nm), 1470 nm fractional non-ablative diode laser combined with intradermal non-crosslinked HA + CaHA mesotherapy, and a daily cosmeceutical regimen.

Results: At three months, clinical evaluation demonstrated restored midfacial volume, improved jawline definition, reduction of erythema, and enhanced skin luminosity, texture, and elasticity. No adverse events were recorded.

Conclusion: A structured multi-level protocol integrating injectable bio stimulants, energy-based devices, and targeted cosmeceuticals offers a clinically effective approach for GLP-1RA-associated facial changes during active pharmacological therapy.

Keywords: GLP-1 receptor agonists; Tirzepatide; Facial volume loss; PEG-crosslinked hyaluronic acid; Calcium hydroxyapatite; Infrared thermolifting; Fractional laser; Multi-level regeneration

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Introduction

GLP-1 Receptor Agonists (GLP-1RAs), including semaglutide and tirzepatide, have become among the most widely prescribed medications globally for type 2 diabetes and chronic weight management, producing mean weight reductions of 10% to 20% over 68-72 weeks [1,2]. As the treated population has expanded, a constellation of facial changes termed 'Ozempic face' has emerged as a recognised aesthetic concern: accelerated fat deflation affecting the temporal and midfacial compartments, progressive skin laxity, perioral rhytides, and periorbital hollowing [2,3].

The pathophysiology extends beyond caloric restriction. GLP-1 receptors are expressed on Adipose-Derived Stem Cells (ADSCs), which regulate dermal collagen and elastin turnover; direct receptor agonism impairs ADSC function, resulting in lipodystrophic fat pad changes and Extracellular Matrix (ECM) degradation [3,4]. Rapid nutritional changes, protein insufficiency, and oxidative stress further compromise epidermal barrier integrity and promote rosacea-like reactivity [2,4]. These combined insults demand a therapeutic strategy extending beyond volume replacement alone.

PEG-crosslinked HA + CaHA fillers offer thermostability and resistance to enzymatic degradation, with documented bio stimulation of collagen types I and III [5,6]. Non-crosslinked HA hydrogels enriched with low-dose CaHA (0.01%) restore dermal hydration and promote fibroblast activation [7]. Broadband infrared (750 mm - 1800 nm) combined with PEG-HA fillers has demonstrated synergistic improvements in skin elasticity and hydration [8]. The 1470 nm fractional non-ablative laser creates controlled microscopic thermal zones within the upper dermis,

inducing neocollagenesis with preserved epidermal continuity [9]. To our knowledge, this is the first published case report describing a structured multi-level protocol specifically targeting GLP-1RA-associated facial changes during ongoing pharmacological therapy.

Materials and Methods

Patient and Ethics

A woman in her early forties presented to Beauttitude Medical Clinic, Manchester, UK, after eight months of tirzepatide (Monjaro, Eli Lilly; titrated to 5 mg/week), with approximately 12.7 kg weight loss. She had no prior aesthetic procedures or systemic diagnoses. Written informed consent was obtained for treatment and publication. Ethical review was waived as the case describes outcomes of standard clinical practice using CE-marked devices and commercially available products.

Treatment Protocol

A three-month multi-level regenerative protocol was implemented during ongoing dual GIP/GLP-1 therapy using the Neauvia product ecosystem (Matex Lab Switzerland SA). Sessions were scheduled monthly.

Injectable treatments (Session 1): Neauvia Stimulate (PEG-crosslinked HA 26 mg/ml, 1% CaHA, glycine, L-proline; 2 ml via 22G cannula) was deposited subdermally in the malar compartments and periauricular region. Neauvia Intense LV (cohesive HA; 1 ml via 27G needle) was delivered as supraperiosteal boluses at the chin and mandibular angle. Neauvia Hydro Deluxe (non-crosslinked HA 18 mg/ml, 0.01% CaHA; micropapular injection at the epidermal–dermal junction across the full face and neck) was repeated at months two and three.

Energy-based treatments (all three sessions): Broadband infrared thermolifting (Zaffiro IR, Z200NG, Berger & Kraft Medical; 750 mm to 1800 nm; heat 45, cooling 15; 70 pulses/session) was performed monthly. The 1470 nm fractional non-ablative diode laser (LaserMe, Berger & Kraft Medical; 28 mJ/point, 2.2 mm spacing for full-face pass; 30 mJ, 2.0 mm for texture areas) was applied after intradermal hydrogel injection at each session.

Cosmeceutical regimen (daily throughout): ceramide-based moisturiser with prebiotic peptide complex (Neauvia Ceramide Shield) twice daily; 30% vitamin C serum (Neauvia C-Shot) each morning; polyhydroxy acid exfoliant (Neauvia PHA) on alternate evenings.

Results and Discussion

At three months, clinical evaluation based on standardised photography and physician assessment demonstrated improvement across all targeted dimensions. Midfacial volume appeared harmonised with restoration of malar fullness and reduction of temporal hollowing. Jawline definition was visibly improved with reduction of early jowling. Skin tone evenness, luminosity, turgor, and surface texture were markedly enhanced, with resolution of rosacea-associated erythema and reactivity (Figure 1 and 2). No adverse events were recorded; mild post-laser erythema resolved within 24 hours. The patient reported restoration of facial identity and marked improvement in psychological wellbeing.

These findings are consistent with the published synergistic effects of PEG-HA + CaHA fillers combined with infrared thermolifting, which has demonstrated +72% improvement in skin elasticity and +49% in hydration at 150 days with histological confirmation of neoangiogenesis and denser collagen architecture [8]. Dermal quality improvements, including erythema reduction and enhanced luminosity, align with evidence supporting the 1470 nm fractional laser combined with biostimulatory hydrogel, which achieved a +70% increase in dermal density [10]. The anti-inflammatory properties of non-crosslinked HA enriched with low-dose CaHA, including modulation of IL-8 and VEGF in keratinocytes [7], likely contributed to calming the rosacea-like reactivity characteristic of this patient population.

Figure 1: Clinical photographs at baseline (left) and three months after completion of the multi-level regenerative protocol (right).

Figure 2: Lateral view at baseline (left) and three months after completion of the protocol (right).

The thermostability of PEG-crosslinked fillers permitted safe co-administration with thermal energy devices without structural degradation [6]. Crucially, the protocol was implemented during ongoing tirzepatide therapy, providing preliminary safety evidence for this approach in an active metabolic context, a clinically important finding given that increasing numbers of patients are expected to remain on long-term maintenance therapy.

Limitations include the single-patient design, absence of objective biometric measurements, three-month observation period, and uncontrolled cosmeceutical component. Prospective studies with larger cohorts, standardised outcome measurements, and longer follow-up are warranted.

Conclusion

GLP-1RA-associated facial changes represent a multi-level therapeutic challenge beyond conventional volume restoration. This case demonstrates that a structured protocol targeting the subdermal, dermal, epidermal–dermal junction, and epidermal layers simultaneously can achieve comprehensive clinical improvement during active pharmacological therapy, with an excellent safety profile. This anatomy-driven approach provides a conceptual framework for the aesthetic management of this rapidly emerging indication and encourages further controlled investigation.

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