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Adjuvant Facial Adipostructuring in the Recovery of Bell's Palsy Associated with a Cerebellar Arachnoid Cyst

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ABSTRACT

Facial aging and pathological conditions impact both aesthetics and function. Facial adipostructuring a non-invasive technique using biomaterials to stimulate local adipose tissue is being explored for its applications in rejuvenation and tissue repair. This clinical case evaluates its effectiveness in a patient presenting with facial contraction due to an arachnoid cyst.

***Methods**: A Facestructure Kit (Mioface) was applied in three biweekly sessions, delivering specific solutions via cannulas into facial fat pads and interseptal spaces. Facial paralysis was assessed using the House-Brackmann scale, alongside patient-reported outcomes on mobility, pressure, spasm, and self-perception.*

***Results:** Improvement in blepharospasm and facial contraction was observed after the first session, progressing from grade 3 to grade 1 on the House-Brackmann scale after the second session. At five months, improvement persisted (grade 2) with minor recurrence, suggesting the potential benefit of complementary therapies. The patient reported pressure relief, spasm control, and enhanced self-confidence.*

***Discussion:** Facial adipostructuring may activate local regenerative cells (dWAT and SVF), promoting tissue repair. Although current literature is limited, activation of resident ADSCs is proposed as a key mechanism. Further research is needed to elucidate the cellular pathways involved and the specific role of dWAT.*

Keywords

Facial adipostructuring, Facial paralysis, Arachnoid cyst, dWAT.

Introduction

Facial aging is a natural process manifested through volume loss and skin laxity. Over time, facial fat undergoes redistribution, volume depletion, and ptosis of structural components, which accentuates the signs of aging [1]. Recent advances have deepened the understanding of facial aging by exploring its etiology at the level of anatomical layers [2]. In response to these biological events, facial adipostructuring has emerged as a non-invasive and personalized alternative for facial rejuvenation. The technique employs a series of manual maneuvers aimed at reorganizing facial fat, restoring lost volume, and naturally enhancing facial contours in a harmonious manner. In pathological contexts, several new non-invasive aesthetic techniques approved by the FDA are now available. These involve the use of biomaterials [3]. As defined by Dr. Gladys Velasco, "Facial adipostructuring is a technique aimed at the paniculopathic reorganization of facial fat compartments, taking into account their structure, physiology, and biomechanics, without removing them under any circumstance" [4]. Although adipostructuring is primarily an aesthetic technique, it presents

significant advantages, particularly its safety profile, as it involves no major risks for the patient. Its components anti-inflammatory, senolytic, and stimulatory agents have shown promising effects not only in aesthetic restoration but also in emerging functional applications. Based on this rationale, the current clinical case was approached using facial adipostructuring. This case report aims to evaluate the efficacy of facial adipostructuring with specific biomaterials to restore both facial function and aesthetics in a patient affected by a cerebellar arachnoid cyst, which led to involuntary contraction of the left hemiface, compromising quality of life and facial appearance. Additionally, this study raises the hypothesis that adipostructuring may activate adipose-derived stem cells (ADSCs) and other components of the stromal vascular fraction (including stem cells, progenitor cells, endothelial cells, immune cells, and other regenerative elements) already present in dWAT and surrounding adipose tissue.

Materials and Methods

Patient Background

The patient presented to consultation in 2024 with a diagnosis of a left middle cranial fossa arachnoid cyst. Although the cyst showed no pathological characteristics, it was associated with neurovascular conflict affecting the face, which had its onset in 2021. The most significant clinical signs included blepharospasm of the lower left eyelid and involvement of the left oral commissure, with a disease course of approximately three years. According to the patient, the condition was initially triggered by stress during the COVID-19 pandemic and tends to worsen during periods of psychological stress or poor sleep hygiene. The patient reported having sought medical attention beginning around 2022, initially consulting general practitioners and later, in 2023, neurologists who were able to establish an accurate diagnosis. However, no effective treatment had been offered up to the time of this report. The patient was prescribed Tegretol (carbamazepine) 200 mg once daily on a continuous basis. He reported a slight improvement in symptoms after nearly one year of use; however, symptoms reappeared upon discontinuation of the medication. In addition to conventional medicine, the patient also pursued complementary therapies, including two sessions of acupuncture in 2023. He reported transient symptomatic relief, with improvement lasting only a few days following each session.

Treatment Structure

A Facestructure Kit (Mioface Laboratory) was used, consisting of three steps (one per session, administered every 15 days). A 22G cannula was used for application into the facial fat pads, while a 27G cannula was employed for the Interseptum treatment applied to interseptal spaces during each session. Each session involved cannular technique with a 22G cannula, applying at least three vectors per fat pad, with a minimum of nine stimulations per vector using linear and rotational movements to stimulate the entire area prior to product deposition. For the Interseptum application, a 27G cannula was used. The interseptal line was marked prior to injection, and the product was deposited in a single bolus without any rotational movements.

Contents and Application of the Facestructure Kit

- Facial Solution – Interseptum – Step 0 (1 vial x 5 ml): *Contents:* Water, dimethylaminoethanol tartrate, sodium chloride, methylsilanol mannuronate, butylene glycol, phenoxyethanol, sorbic acid, acetyl hexapeptide-38. *Technique:* A 27G cannula was used to mark the interseptal line, followed by a single deposit of product without rotational movement.
- Firming Facial Solution – Step 1 (1 vial x 5 ml): *Contents:* Water, carnitine, sodium benzoate, sodium chloride, caffeine, troxerutin, butylene glycol, glycerin, propylene glycol, *Melilotus officinalis* extract, *Centella asiatica* extract, potassium sorbate, acetyl hexapeptide-38. *Technique:* Applied across the entire face using a 22G cannula; additionally, 1.5 ml of Interseptum solution was injected into the interseptal spaces using a 27G cannula.
- Firming Facial Solution – Step 2 (1 vial x 5 ml): *Contents:* Water, pyruvic acid, sodium benzoate, sodium chloride, sodium hydroxide, caffeine, butylene glycol, glycerin, *Centella asiatica* extract, potassium sorbate, acetyl hexapeptide-38. *Technique:* Applied to all facial fat compartments using a 22G cannula, and 1.5 ml of Interseptum was injected into the interseptal spaces with a 27G cannula.
- Facial Solution – Step 3 (1 vial x 5 ml): *Contents:* Water, carnitine, sodium chloride, *Centella asiatica* extract, glycerin, potassium sorbate, sodium benzoate, methylsilanol mannuronate, phenoxyethanol, sorbic acid, pyruvic acid, sodium hydroxide, butylene glycol, acetyl hexapeptide-38. *Technique:* Applied to all facial fat pads with a 22G cannula, and 1.5 ml of Interseptum was administered with a 27G cannula in the interseptal spaces.

In total, three sessions were performed at 15-day intervals. In each session, 5 ml of the corresponding solution was applied (2.5 ml per hemiface), along with 1.5 ml of Interseptum (0.75 ml per hemiface). To assess facial paralysis severity, the House–Brackmann grading system was used. The initial stage at the start of treatment was classified as Grade 3 (moderate dysfunction).

Results

At the end of the first session, the patient reported immediate relief of pressure in the affected area. Clinically, prior to treatment, the patient exhibited approximately 30 blinks per minute in the affected eye, compared to fewer than 20 blinks per minute in the unaffected side within normal physiological parameters. By the end of the first session, blinking frequency and muscle contraction in the affected region had normalized. According to the House–Brackmann grading system, the patient was reclassified from Grade 3 to Grade 2, as illustrated in Figure 1.

At the beginning of the second session (15 days later), a slight increase in blinking frequency was observed on the affected side compared to the unaffected side. However, by the end of the session, blinking was once again fully normalized. The patient was then classified as Grade 1 on the House–Brackmann scale, as shown in Figure 2.

Figure 1: Patient at the beginning of treatment, classified as Grade 2 on the House–Brackmann scale.

Figure 2: Patient after the second session, classified as Grade 1 on the House–Brackmann scale.

The effect of the second session remained stable over the following 15 days. The patient reported only brief episodes of involuntary muscle contraction, primarily during periods of stress and inadequate sleep. Consequently, a third session was performed. Upon completion, a marked improvement was observed, with involuntary muscle contractions becoming clinically imperceptible. Evaluation using the House–Brackmann grading system confirmed the patient remained at Grade 1, as shown in Figure 3.

Figure 3: Patient after the third session, maintaining Grade 1 on the House–Brackmann scale with no visible involuntary muscle contraction.

At the end of each session, a noticeable improvement was observed in both involuntary muscle contraction and fatigue in the affected area. Moreover, results improved progressively with each session. Although the effects had not completely resolved after three months, the overall evolution remained positive. A follow-up evaluation conducted five months after the initial treatment confirmed that the patient had not returned to the baseline state. As a result, complementary treatment with botulinum toxin was planned, along with additional sessions in the near future. According to the House–Brackmann scale, the patient was classified as Grade 2 on the left side, presenting mild facial muscle weakness with minor difficulties in eye closure and smiling. However, most facial movements remained normal, as shown in Figure 4.

Patient-Reported Outcomes

Regarding the patient's subjective experience, the following aspects were reported at the end of the three treatment sessions and at the five-month follow-up:

Mobility: The patient experienced an immediate improvement in voluntary facial mobility following the first session, with progressive enhancement in subsequent sessions (Figure 1). This improvement has been maintained up to five months post-treatment (Figure 4).

Figure 4: Patient at three-month follow-up after treatment, classified as Grade 2 on the House–Brackmann scale.

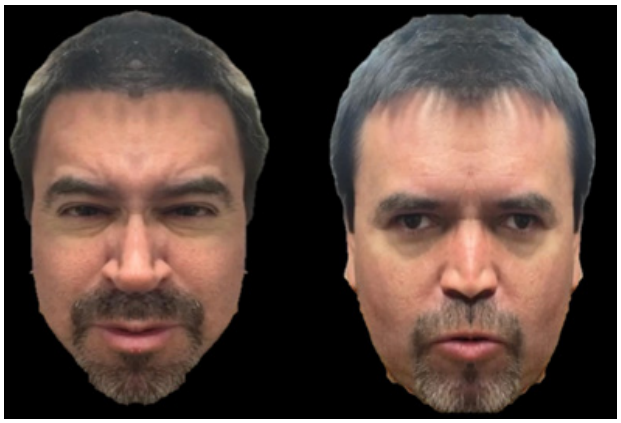

Figure 5: Mirror imaging technique applied to both right and left hemifaces to assess facial symmetry and function. Patient at three-month follow-up, classified as Grade 2 on the House–Brackmann scale.

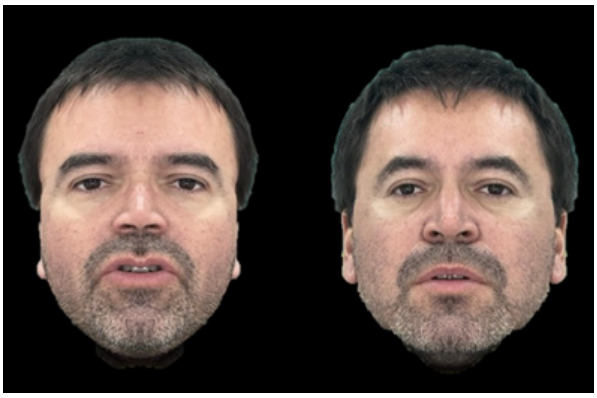

Figure 6: Mirror imaging technique after treatment, showing both right hemifaces and both left hemifaces in opposition to assess post-treatment facial symmetry

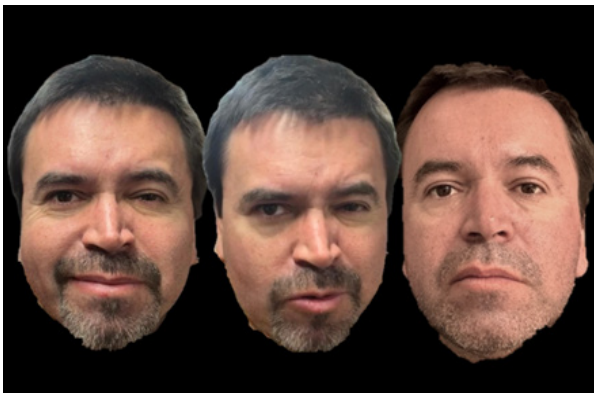

Figure 7: Clinical progression throughout the months of treatment, demonstrating changes in facial symmetry, muscle tone, and involuntary contraction over time

Pressure Sensation: The patient reported a significant reduction in the sensation of pressure in the affected area, previously present before adipostructuring. A complete sense of relief was maintained for approximately one month after the third session (Figure 3). Beginning in the second month, a mild discomfort reappeared and persisted for nearly four additional months, though it was notably less intense than at baseline.

Spasm Control: Both clinical observation and patient feedback confirmed a reduction in facial spasm after the first session, resulting in decreased discomfort. This effect remained nearly complete for approximately three months. Starting in the fourth month, the patient reported a slight return of symptoms, though still markedly improved compared to the initial condition.

Self-perception: The patient reported increased confidence and a greater sense of emotional security regarding his facial appearance.

Discussion

This clinical case suggests that facial adipostructuring may stimulate a specific cell population characterized by high plasticity, capable of both differentiation and dedifferentiation, thereby facilitating tissue repair. Although there is currently no literature explicitly describing this mechanism in the context of adipostructuring, it is plausible to hypothesize the involvement of dermal white adipose tissue (dWAT) as a local reservoir of regenerative cells activated by the treatment [5]. dWAT, located within the dermis, contains not only mature adipocytes but also a significant population of adipose-derived stem cells (ADSCs) and other resident components of the stromal vascular fraction (SVF) [6]. These cells are known for their ability to differentiate into various cell lineages, including connective tissue, endothelial cells, and, under specific conditions, cells with features similar to those of damaged tissue [7]. If adipostructuring indeed acts through stimulation of local adipose tissue, it may trigger the activation of these regenerative cells within the dWAT and possibly in adjacent subcutaneous fat compartments [4]. Once activated, these cells may respond to microenvironmental signals from the damaged tissue by initiating repair processes through phenotypic modulation and differentiation. The proposed concept of "dedifferentiation" could reflect the dynamic ability of these cells to shift phenotypes based on local tissue demands a concept still under investigation but supported by emerging evidence on the plasticity of stem and progenitor cells within adipose tissue, including those residing in dWAT [8]. Therefore, although current scientific literature remains limited regarding the direct stimulation of cellular differentiation and dedifferentiation by adipostructuring via dWAT, the biological composition of local adipose tissue rich in ADSCs and SVF components, both in subcutaneous and dermal extensions provides a plausible framework to explain the reparative effects observed in this clinical case. Further research is needed to fully elucidate the cellular and molecular mechanisms involved, and to define the specific role of dWAT in tissue regeneration induced by adipostructuring as a localized stimulation strategy.

Conclusions

1. **Targeted Bioactivation via Facial Adipostructuring:** Facial adipostructuring enabled the transdermal application of active solutions directly to targeted treatment areas. These bioactive formulations nourished and revitalized the tissue, strengthening ligaments and producing a biostimulating effect not only on adipose tissue but also on collagen-producing cells. Indirectly, this may promote the repair of affected tissues.
2. **Treatment Efficacy:** The use of the Facestructure Kit (Mioface Laboratory) proved effective in reducing symptoms of blepharospasm and involuntary facial contractions. Improvement was evident from the first session and remained consistent throughout the three-session protocol, with a significant reduction in blink frequency and muscle contraction.
3. **Duration of Effect:** While the treatment provided immediate relief and sustained improvement over several months, the effects were not permanent. At five months post-treatment, the patient had not reverted to the baseline condition but experienced mild symptom recurrence, suggesting the need for complementary or maintenance therapies.

4. **Combination Therapy Potential:** Combining facial adipostructuring with botulinum toxin was considered necessary to maintain and enhance long-term outcomes. This supports the idea that a multimodal therapeutic approach may be more effective in managing such conditions.
5. **Impact on Quality of Life:** Beyond physical symptom relief, the treatment had a positive effect on the patient's self-perception and confidence. The reduction in discomfort and improved facial mobility contributed to an overall enhancement in quality of life.
6. **Triggering and Exacerbating Factors:** Stress and poor sleep hygiene were identified as factors that exacerbated symptoms. This underscores the importance of addressing psychosocial and lifestyle elements as part of a comprehensive management strategy for facial paralysis.

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