

C A S E R E P O R T

The essential role of Aesthetic Medicine in facial paralysis: combination of techniques

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Abstract. The face is the first point of contact in communication interactions; it reveals the person's feelings and emotions. Injuries caused to the facial nerve, which is responsible for the innervation of the facial mimic muscles, can have important physical, psychological and even social repercussions. Bell's palsy or idiopathic peripheral facial paralysis is the most common cause and is characterized by the unilateral paralysis of the muscles, producing a clear pattern of asymmetric facial expressions. Patients with facial paralysis have common features: the paralyzed side has few wrinkles, the nasolabial fold is less evident, and drooping of the labial commissure and eyebrow may occur; the contralateral side responds with a muscle hyperkinetic reaction. The treatment of facial paralysis aims to recover symmetry in both static and dynamic states, with the combination of surgical and aesthetic methods playing an essential role in the treatment of this pathology. In the search for local symmetry, Aesthetic Medicine plays an important part, by using different methods, such as botulinum toxin injections or the application of hyaluronic acid fillers. In this sense, this article aims to present a case of a woman affected by facial paralysis, in whom Aesthetic Medicine played an essential role in self-esteem and functional recovery. With a substantial clinical improvement, softening asymmetries and reducing hyperkinetic muscle activity proved to have an essential impact in this patient's facial asymmetry, promoting a considerable enhancement in her quality of life and social well-being.

Keywords. Botulinum toxins, esthetics, facial asymmetry, facial nerve injuries, facial paralysis, hyaluronic acid

Introduction

Facial expressions are something that we often take for granted. The face is our platform to interact with the world and our expressions are conveyed to others to help define us and interrelate. When someone suffers from any facial affection, he or she may lose complete ability to confidently socialize with the world or perform satisfactory social or professional relationships.

The facial nerve (VII cranial nerve) is responsible for the innervation of the facial mimic muscles, by the resting tone and by the voluntary and involuntary contraction of each hemiface in the human body. Injuries of the facial nerve can produce deformities in varying degrees, causing aesthetic and functional disorders¹.

The main causes of facial paralysis include cerebrovascular accidents, surgical injuries, trauma and paralysis of undetermined etiology (Bell's Palsy, the most frequent cause)². Patients with facial paralysis have common features: the paralyzed side has few wrinkles, the nasolabial fold is less evident, and drooping of the labial commissure and eyebrow may occur. The contralateral side responds with a muscle hyperkinetic reaction, due to the lack of tone on the paralyzed side. Patients not only suffer from difficulty in daily tasks such as articulation, eating and drinking, but it is often considered cosmetically undesirable, rendering psychological consequences such as low self-esteem, social isolation, anxiety, and depression³⁻⁷.

The treatment of facial paralysis aims to recover symmetry in static and dynamic states, which are both

usually affected in this condition¹. Previous studies mainly emphasize surgical and invasive methods in the treatment of this pathology, including nerve grafts, muscle transfers, microsurgical flaps, neurectomies and myotomies⁸⁻¹⁵. Other treatments include physical therapy, muscle relaxants, facial massages and acupuncture.

Beyond these methods, there are several possibilities of treatments in Aesthetic Medicine, which include botulinum toxin to relax the hyperkinetic compensatory muscles, hyaluronic acid to restore volume, tensioning threads to reposition tissues, platelet-rich plasma, carboxytherapy or microneedling to restore skin appearance, among others. Each patient must be approached in a personalized, individual manner, to assess the needs and establish a course of action for optimal final results.

The botulinum toxin injection (chemodenervation) has been used in the treatment of asymmetries caused by facial paralysis and has shown promising results and improvements in the patient's quality of life¹⁻⁷; however, only a small minority of injectors feel able to treat this condition, which requires a complex approach and a detailed knowledge of facial functional anatomy. Its use has been expanded for clinical as well as aesthetic indications, and despite the increasing utility of botulinum toxin in treating facial paralysis, practical guidelines for

adequate patient assessment, brand choice, injection plan and techniques are lacking¹⁶.

Injectable dermal fillers have established their protagonism for many years in facial volume enhancements and to treat signs of facial aging, with the number of soft-tissue filler procedures performed each year rising. Hyaluronic acid fillers are a safe, effective, and reversible treatment that provides natural-looking long-term results with little downtime¹⁷. Facial paralysis can cause the facial muscles to atrophy or become significantly smaller. Additionally, there can be large changes in the volume, size, and shape of the patient's face, depending on the etiology of the paralysis. In these situations, filler injections can improve the contour and help restore appearance.

Case Presentation

A 71-year-old female patient was referred to our Aesthetic Medicine department for a clinical evaluation. She presented a history of right facial paralysis, diagnosed in 2002, with undetermined etiology or idiopathic partial right hemifacial paralysis, Bell's Palsy (Figure 1).



Figure 1. Right facial paralysis with asymmetry on static (left) and dynamic (right) evaluation, before any aesthetic procedure.

The patient was otherwise healthy and had no known allergies; major surgeries only included total hysterectomy in 2012. She did not notice any change in her condition in the past few years since the diagnosis.

Upon dynamic facial analysis and detailed examination, there was a clear pattern of asymmetry with none to little movement of the right facial side, mainly on the movement of the lips, eyebrows and medial cheek, and hypertrophic compensation of the left facial side. According to the Sunnybrook (Toronto) facial grading system, the patient scored 57 points before all procedures¹⁸.

A treatment plan was drawn and included the application of botulinum toxin as a first step. A total dose of 40 units of botulinum toxin (900 kilodalton *Clostridium botulinum* type A neurotoxin) was injected intramuscularly in the upper third of the face (frontalis, orbicularis oculi, corrugator and procerus muscles) and malar area to correct the asymmetry (Figure 2). Also, in the cervical region, 6 units were applied to correct a small asymmetry in the platysma muscle.



Figure 2. Points of application of botulinum. 46 units were applied in the upper third of the face, malar area and cervical region as shown by the yellow dots.



Figure 3. Points of application of hyaluronic acid filler injections. 5 mL were applied in the left zygomatic arch (3 points, white, needle, periosteal), left medial and middle cheek fat (arrow, white, cannula, retrograde), left mandibular angle (1 point, white, needle, periosteal) and left jawline (arrow, white, cannula, retrograde), right deep pyriform space (1 point, white, needle, periosteal), right nasolabial fold (arrow, white, cannula, retrograde), right and left melomental fold (arrows, red, cannula, retrograde), left perioral area (8 points, red, needle) and deep central menton area (1 point, white, needle, periosteal). The points represent needle injections, and the arrows represent cannula injections.

In a second step, two weeks later, hyaluronic acid filler injections were applied, aiming to achieve a more symmetric result. Injections were applied in the left zygomatic arch, left medial and middle cheek fat, left mandibular angle and left jawline, right deep pyriform space, right nasolabial fold, right and left melomental fold, left perioral area and deep central menton area. In total, 5 mL of 22, 26 and 28 mg/mL, hyaluronic acid filler were applied.

No adverse reactions were observed and the effect of the injections improved in the following weeks. A re-evaluation was performed 4 weeks after the final procedure; an aesthetically excellent outcome was achieved, meeting the patient's expectations (Figure 4). After all procedures, according to the Sunnybrook (Toronto) facial grading system, the patient scored 76 points after subjective evaluation¹⁸.

Discussion

The aesthetic rehabilitation of a patient with facial paralysis aims to recover symmetry at rest and during voluntary and involuntary facial mimicry. The best

results are obtained with the combination of several different techniques.

The action of botulinum toxin in the reduction of the contralateral hyperkinesis of the perioral area is well known¹; it may offer a reversible therapeutical test before some definitive surgical procedures¹⁹⁻²¹. Botulinum toxin injections can be artfully performed in strategic manners in the paralyzed as well as the non-paralyzed hemiface, to achieve significant improvements in the way the patient talks, blinks, smiles, and overall appearance.

Studies on the application of botulinum toxin in facial paralysis have a high rate of success²², regardless of the etiology. This can be considered an outpatient procedure, almost always without any need for local anesthesia^{23,24}. Adverse events from the use of botulinum toxin are rare and include, among others, bruising, infections, oral incontinence or allergies^{25,26}.

Occhiogrosso et al²⁷, in a prospective study, evaluated the functional, psychosocial and overall wellbeing implications of dermal fillers in patients with facial paralysis, and pointed that there is a significant improvement in their well-being after just a single treatment, with enhancements in their self-confidence and emotional expression. A comprehensive evaluation of the medical history is critical, with particular attention to the time-course of the disorder, as well as the contraindications to the procedures in question. Moreover, the patient should be questioned about the main concerns and which areas of the face and neck are the most troubling, since these should be the first to be addressed.

Sadiq et al²⁸ described the impact of psychological distress and the extent of anxiety and depression in facial paralysis, concluding that there was a significant higher level of psychological distress and illness perception in these patients. The inability to smile and express emotion symmetrically is the most distressing characteristic, leading to greater levels of anxiety, depression, maladaptive behaviours and reduced emotional well-being.

Furthermore, a thorough understanding of the facial musculature and neural anatomy, its role in facial expression, as well as its function, is paramount to determine the required injection areas, definition and distribution of injection points²⁹. As with other



Figure 4. Right facial paralysis before (left) and 30 days after botulinum toxin and hyaluronic acid filler aesthetic procedures (right).

treatments in Medicine, the principles of maximizing patient benefit while minimizing potential risks should be respected when treating patients with facial paralysis³⁰.

In this case, a more symmetrical facial expression after aesthetic procedures, both in static and dynamic, resulted in a very satisfied patient, stating that these treatments had markedly improved her self-esteem.

In conclusion, this case represents evidence that there is a considerable benefit with aesthetic treatments in patients suffering from facial paralysis. Both botulinum toxin and hyaluronic acid can be considered useful tools in the approach to facial paralysis. The increase in self-esteem that Aesthetic Medicine can provide in this condition is unquestionable; with a well elaborated clinical history, a detailed physical examination and a carefully studied plan of combined treatments, we can reach very satisfying results and minimize the long-term impact of this condition.

Disclosure

All authors declare that they have no conflict of interest in the elaboration of this article.

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