



## The Application of Botulinum Toxin in Times of COVID-19: Highlighting the Upper Third of the Face

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### Abstract

Botulinum toxin type A has gained fame for its aesthetic results. However, it is a drug that was initially used by Ophthalmology, indicated in cases of blepharospasm and strabismus, with therapeutic purpose. The toxin has been indicated in various dental indications, such as gummy smile; bruxism and clenching; masseteric hypertrophy; trismus; temporomandibular dysfunctions; coadjuvant to surgical procedures such as arthrocentesis or during the osseointegration period, reducing masticatory forces; orofacial pain; facial palsy; sialorrhea; and oromandibular and orofacial dystonia. The protocol for facial aesthetics is basically the same as for orofacial pain. Care is required to ensure that the results are not asymmetrical or artificial. During the COVID-19 pandemic, the upper third of the face was highlighted by the use of protective masks. This evidencing also caused the need for aesthetic care, despite the various management methods during the pandemic, such as social isolation and lockdown imposed by security and public health measures. The purpose of this article is to present the case of a patient who, during the COVID-19 pandemic, required for aesthetic reasons, the application of botulinum toxin in the upper third of the face. The aesthetic results were presented and discussed. The botulinum toxin applications, in this pandemic phase, became a relief for patients, increasing satisfaction, self-esteem and quality of life.

**Keywords:** Botulinum Toxins Type A; Aesthetics; Dentistry

### Introduction

As of the emergence of COVID-19 by coronavirus infection in late 2019, we observed the largest pathological outbreak in modern history. As soon, safety and public health measures were required to try to mitigate the rapid evolution of the disease. The reduction and cancellations of elective procedures in the areas of Medicine and Dentistry were the first recommendations, with the purpose of limiting the unnecessary exposure of patients and

professionals to the contagion. Crisis in the supply of inputs and personal protective equipment occurred right at the beginning of the pandemic. In parallel, most of the work became, when possible, remote by video calls. This new form of conviviality and contact highlighted the face. In parallel, the obligatory use of the mask hid the middle and lower thirds of the face, highlighting the upper third of the face [1-3].

The expression lines and rhytids of the upper third of the face are associated, not only with aging, but also with signs of stress,

anxiety and anger, very common in this pandemic phase, with isolation and social distancing. Historically, one of the main forms of treatment and management in the attenuation of these signs is the application of botulinum toxin [1,2].

Besides the results of aesthetic and therapeutic clinical effects, several other characteristics, such as safety, predictability and minimal morbidity of botulinum toxin have contributed to its popularity. Satisfaction with the results, improved self-esteem and quality of life are quite frequent reports [4-15].

Botulinum toxin type A is a drug, first used in Ophthalmology, in cases of blepharospasm and strabismus, in 1976. Only in 2002 in the USA, it was approved by the Food and Drug Administration for aesthetic indications [4]. The aesthetic and therapeutic dental indications include gummy smile; bruxism and clenching; trismus; masseteric hypertrophy; facial palsy; temporomandibular dysfunctions; sialorrhea; orofacial and oromandibular dystonia. During the osseointegration phase, it reduces masticatory forces and prevents the fracture of prostheses and implants. It can also be used as an adjunct to surgical procedures such as arthrocentesis. In cases of orofacial pain, the application protocol is the same as for aesthetics [4-15].

### Purpose of the Study

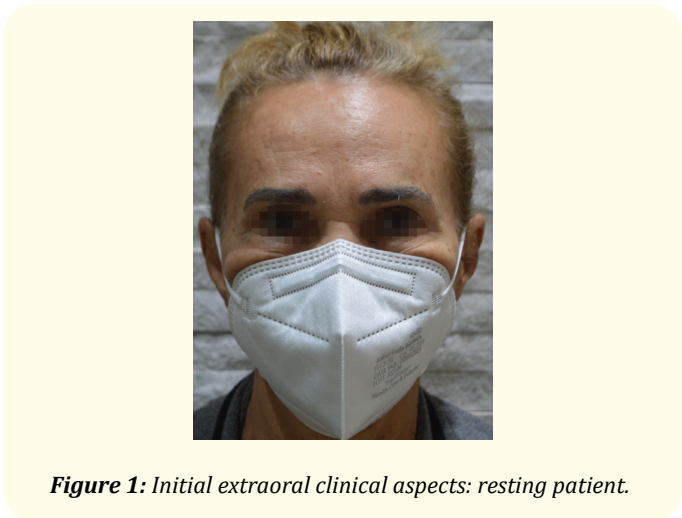
The purpose of this article is to present the case of a patient who, during the COVID-19 pandemic, required for aesthetic reasons, the application of botulinum toxin in the upper third of the face.

### Case Report

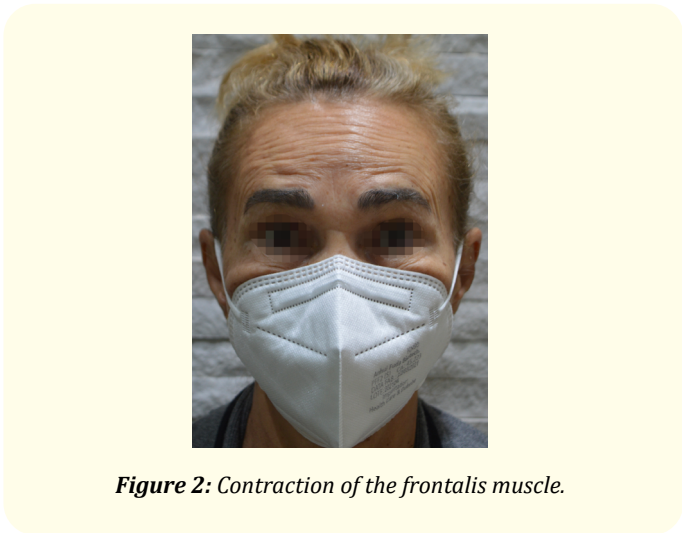
Caucasian female patient, 66-years-old, attended to the clinic for the aesthetic application of botulinum toxin.

The botulinum toxin applications are assiduous. However, due to the COVID-19 pandemic, the patient was absent from the clinic and frequent applications. No diseases or systemic alterations were reported.

Patient evaluation and extraoral photographs of resting and facial mimicry were taken (Figure 1-4). The recommendation for applications in the upper third of the face is summarized in table 1.



**Figure 1:** Initial extraoral clinical aspects: resting patient.



**Figure 2:** Contraction of the frontalis muscle.



**Figure 3:** Contraction of the glabellar region (procerus and corrugators muscles).



**Figure 4:** Contraction of the orbicular muscle of the eye: right side (A); frontal view (B); left side (C).

Region/muscle	Points	Units
Frontalis	21	42
Glabella	5	10
Orbicular of the eye right side	6	12
Orbicular of the eye left side	6	12

**Table 1:** Amount of botulinum toxin defined by regions in the aesthetic application, particularized in this case.

Prior to the application, dermatological anesthetic (Dermomax™, Aché, São Paulo, Brazil) was used in each point, which remained for 15 minutes. Two units of botulinum toxin type A (Botox™, Allergan Pharmaceuticals, Westport, Ireland) were applied per point. The dilution protocol was recommended by the manufacturer: 1 ml of sterile, cooled saline solution for 100 units. The patient was instructed not to lower her head and prescribed analgesics in case of pain after the applications.

The patient was evaluated 15 days after the application. Post-application photographs were taken, comparing them with the initial ones, at rest and in muscle contraction following the mimicry previously performed (Figure 5-8). No complaints or complications were reported. The patient was also instructed as to the duration of the aesthetic effects of botulinum toxin (4 to 6 months).



**Figure 5:** Final extraoral clinical aspects: resting patient.



**Figure 6:** Mitigation of rhytides and expression signs of the frontalis muscle after the application of botulinum toxin.



**Figure 7:** Mitigation of rhytides and expression signs of the glabellar region (procerus and corrugators muscles) after the application of botulinum toxin.



**Figure 8:** Mitigation of rhytides and expression signs of the orbicular muscle of the eye after the application of botulinum toxin: right side (A); frontal view (B); left side (C).

### Discussion

Currently, the search for aesthetic procedures has been widely sought after particularly in relation to facial aesthetics. The COVID-19 pandemic, which imposed social isolation and remote work and study and the compulsory use of facial masks, helped to highlight even more the upper third of the face [1-19].

Botulinum toxin has been widely used by the dental surgeon, in various therapeutic and aesthetic indications in the area of stomatology. The applications performed in the frontal, orbicular of the eyes and glabella region (composed of the procerus and corrugator muscles), with aesthetic indication, as observed in this report, should receive applications equally and evenly distributed, thus avoiding asymmetric and artificial results [4-13,16-19].

Botulinum toxin is an enzyme synthesised by the Gram-positive anaerobic bacterium *Clostridium botulinum*. Seven distinct types are produced (A, B, C<sub>1</sub>, D, E, F and G). However, only subtypes A, B and E have therapeutic characteristics. Botulinum toxin type A is the most widely used and the most potent [4,9]. Botulinum toxin promotes temporary chemical denervation of musculoskeletal fibres by blocking the release of acetylcholine at the neuromuscular junction, restricting muscle contraction. Muscle weakening is temporary and has no systemic effects [4].

The peak of maximum effect occurs after 14 days of application, in which should be performed the evaluation of the results and verification of the need for retouching. The duration varies from 3 to 6 months, depending on the commercial brand [4-13].

The occurrence of some adverse events such as hematomas, pain at the injection site, infection, edema, eyelid ptosis and asymmetry is possible. Care in the application, such as precision of the technique, attention to dosage and location of the puncture can reduce the risks of these complications, since the events are technique-dependent [4-13]. No complaints or changes resulting from the application were reported in the present case.

The application of botulinum toxin is contraindicated in pregnant and lactating women; and patients with muscular and neurodegenerative diseases, such as myasthenia gravis, Eaton-Lambert syndrome, Charcot disease and amyotrophic lateral sclerosis [4-13].

The popularity of botulinum toxin among patients can be explained by the predictable results and accessibility, favoring its acceptance [16]. As well as observed in figure 5-8, significant results have been reported, as well as the favoring of personal and social relationships, and satisfaction with appearance, self-esteem, sense of well-being and subsequently improvement in quality of life [1,16,17]. Self-impression seems to trigger a biofeedback phenomenon. Patients feel better about themselves and, on a

biochemical level, neurotransmitters important for mood are indirectly affected [16]. Additionally, the esthetic application of botulinum toxin improved symptoms of depression [19], orofacial pain [15] and favoured the remission of oral lichen planus, increasing self-esteem and quality of life [12].

## Conclusion

The aesthetic applications of botulinum toxin carried out by the dental surgeon, can promote the valorisation of the dental work, favouring the increase in self-esteem and well-being, and increasing the quality of life, so attacked in this phase of the COVID-19 pandemic.

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