

Management of Stomatological Signs and Symptoms Due to Stress During the Covid-19 Pandemic: Case Report

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Abstract

Several alterations, diseases or conditions have been observed since the beginning of the COVID-19 pandemic. In the same perspective, some stomatological alterations have been observed, also as a result of stress and anxiety experienced during the pandemic. The purpose of this article is to report the case of a patient who presented frontal, temporal, masseteric and occipital headache, and geographic tongue, caused by stress during the COVID-19 pandemic. Botulinum toxin applications were performed in the frontal, temporal, masseteric and occipital regions for painful symptomatology. The applications showed suppression of painful symptoms, improved self-esteem and quality of life, and subsequently favoured the remission of the geographic tongue.

Keywords: COVID-19; Orofacial Pain; Geographic Tongue; Botulinum Toxins Type A; Dentistry.

Introduction

Almost two years in the midst of the beginning of the COVID-19 pandemic, we have observed several changes in society, in biosafety care, in dental and medical practice¹.

Several conditions, diseases and sequelae systemic arising from and associated with coronavirus infection have been known. Simultaneously, numerous stomatological alterations have been observed in these times. The first ones observed refer to deficient alterations related to smell (hyposmia and anosmia) and taste (hypogeusia and ageusia). Salty taste was secondarily reported, regardless of diet, consumption of salty food, use of toothpaste or mouthwash, or smoking². Aphthous ulcerations; stomatitis; herpetiform lesions; mucositis; candidiasis; geographic, fissured, or depapillated tongue; erythema multiforme-like lesions; Kawasaki-like lesions; atypical Sweet syndrome lesions; Melkerson-Rosenthal syndrome; COVID-19-associated maxillary nerve branch mononeuropathy; bullous angina; angular cheilitis; and necrotizing periodontal disease were oral manifestations described³⁻⁵.

It is important to emphasize the existence of predisposing factors for the appearance of stomatological lesions in patients with COVID-19, such as stress, immunosuppression, opportunistic infections, poor oral hygiene, vasculitis and hyperinflammatory response secondary to COVID-19⁵.

Additionally, an increase in dental fractures due to excessive masticatory forces has been observed, associated with headaches secondary to parafunctional habits (bruxism and clenching). These oral conditions are the result of stress and anxiety caused by the COVID-19 pandemic¹.

By the aesthetic or therapeutic purpose, botulinum toxin has been widely used in Dentistry⁷⁻¹⁹. Initially used in 1976 in Ophthalmology for the treatment of blepharospasm, botulinum toxin is a drug that originally presented therapeutic purpose. Later, it was observed the attenuation of expression wrinkles near the periorbital region, stimulating its aesthetic indication. However, it was only approved by the Food and Drug Administration for aesthetic indications in 2002. In Brazil, the authorization for dental surgeons to apply botulinum toxin at facial level for aesthetic procedures only occurred in 2019⁸.

Among the indications in the stomatognathic system, botulinum toxin can be applied in gummy smile; temporomandibular dysfunctions, including parafunctional habits such as bruxism, clenching and trismus; masseter hypertrophy; adjuvant in surgical procedures such as arthrocentesis. In implant dentistry, it reduces masticatory forces, promotes the osseointegration period and prevents the fracture of prostheses and implants. In cases of orofacial pain, the same protocol is used for aesthetic applications⁷⁻¹⁹. More recently, botulinum toxin helped in the remission of oral lichen planus by improving self-esteem after aesthetic applications¹⁶.

Health is defined as "a state of complete physical, mental and social well-being and not merely the absence of disease and infirmity" by the World Health Organization (WHO). In this perspective, aesthetics can also be contemplated by this definition²⁰⁻²³. Still taking advantage of this concept, one can determine the role of stress nowadays on psychosomatic conditions such as headache and geographic tongue.

The purpose of this article is to report the case of a patient who presented frontal, temporal, masseteric and occipital headache, and geographic tongue, caused by stress. The patient received botulinum toxin applications.

Case Report

A Caucasian female patient, 39-years-old, came to the clinic complaining of frontal, temporal, masseteric and occipital headaches.

Clinically, the patient presented satisfactory oral health, with absence of teeth 16, 17, 27, 36 and 46. Tooth 24 was fractured, leaving only the root portion, due to symptomatic bruxism (Figure 1). Symptomatic whitish lesions were observed on the lingual dorsum, characteristic of the geographic tongue, resulting from emotional stress (Figure 2).

Radiographically, tooth loss and the remaining root of tooth 24 were observed (Figure 3).

The patient had been using a occlusal splint for 1 year (Figure 4). However, the patient was advised to apply botulinum toxin to minimize frontal, temporal, masseteric and occipital pain symptoms. Additionally, anxiety control was suggested, possibly pharmacological, and the patient was referred to a psychiatrist. The application of botulinum toxin was well accepted by the patient and, after clarifying all doubts, it was scheduled. The patient was instructed about the duration of the botulinum toxin effect, ranging from 4 to 6 months.



Figure 1: Initial intraoral clinical aspects: dental absences and tooth 24 fractured.



Figure 2: Symptomatic whitish lesions on the lingual dorsum, characteristic of the geographic tongue.



Figure 3: Panoramic radiographic showing tooth loss and the remaining root of tooth 24.

**Figure 4:** Occlusal splint.

Initial extraoral photographs were taken at rest (Figure 5) and during contraction of the muscles of mimicry (Figures 6 and 7) to establish the planning of the applications. The glabella region, frontal (Figure 8), masseter and temporal (Figure 9), and occipital (Figure 10) muscles received the applications, whose quantities were summarized in Table 1. The dermatological anesthetic (Dermomax™, Aché, São Paulo, Brazil) was applied over the points and remained for 10 minutes. Each point in muscles of the mimic (frontal and glabella region) received 2 units of botulinum toxin type A (Botox™, Allergan Pharmaceuticals, Westport, Ireland). The occipital and temporalis muscle points received 5 units. The masseter muscles received 10 units. The botulinum toxin was diluted according to the guidelines suggested by the manufacturer (1ml of sterile, cooled saline for 100 units).

After 15 days, the patient was evaluated. The patient reported reduced pain symptomatology in the regions that received the botulinum toxin applications. No complaints or complications were reported. Clinically, the botulinum toxin showed attenuation of the expression lines in the frontal and glabella regions (Figures 11 to 13). Concomitantly, reduction of stress and anxiety and improvement of whitish lesions of the geographic tongue were observed (Figure 14).

The patient was instructed about the need for future applications, according to the painful symptomatology, 4 to 6 months after the first application.

**Figure 5:** Initial clinic intraoral aspects: resting patient.**Figure 6:** Initial clinical aspects: contraction of the frontalis muscle.**Figure 7:** Initial clinical aspects: contraction of the glabellar region (procerus**Figure 8:** Planning containing application points of botulinum toxin in the frontal and glabellar regions, and use of dermatological topical anaesthetic.**Table 1:** Quantity of points and respective units divided by regions / muscles.

| Region / Muscle | Quantity of Points | Quantity of Units |
|------------------------|--------------------|-------------------|
| Frontalis | 12 | 24 |
| Glabellar | 4 | 8 |
| Masseteric (bilateral) | 6 | 60 |
| Temporal (bilateral) | 2 | 10 |
| Occipital | 2 | 10 |



Figure 9: Planning containing application points of botulinum toxin in the temporal and masseteric regions, and use of dermatological topical anaesthetic.



Figure 10: Planning containing application points of botulinum toxin in the occipital region, and use of dermatological topical anaesthetic.



Figure 11: Clinical aspects after application of botulinum toxin: resting patient.



Figure 12: Clinical aspects after application of botulinum toxin: frontalis muscle contraction.



Figure 13: Clinical aspects after the application of botulinum toxin: contraction of the glabellar region (procerus and corrugators muscles).



Figure 14: Improvement of whitish lesions of the geographic tongue.

Discussion

Several alterations resulting from coronavirus infection involve painful symptoms. In this perspective, the use of botulinum toxin presents great advantage, since it is indicated in the management of chronic pain^{8-11,18,19}. The botulinum toxin promotes the temporary chemical denervation of the musculoskeletal fibers, by blocking the release of acetylcholine in the neuromuscular junction between the nerve endings of the alpha and gamma motor neurons, preventing muscle contraction, and secondarily reducing the pain process⁸.

Botulinum toxin has an effect of 3 to 6 months, depending on intrinsic patient factors and the commercial brand⁸⁻¹⁸.

Some adverse events and complications may occur and are technique-dependent, such as pain and infection at the injection site, edema, hematomas and asymmetries. The dental surgeon must be attentive to the precision of the technique, dosage, and location of the puncture. Care should be taken to avoid that applications cause asymmetric, non-aesthetic, and artificial results⁷⁻¹⁹. No complaints or complications arising from the application were reported in the present case.

Patients who have muscle and neurodegenerative diseases, such as myasthenia gravis, Eaton-Lambert syndrome, Charcot disease and amyotrophic lateral sclerosis; pregnant and lactating women and patients with hypersensitivity to botulinum toxin, lactose and albumin should not receive botulinum toxin applications⁸⁻¹⁹.

In this case, the concomitant action between the aesthetic and therapeutic results of botulinum toxin applications was observed. Figures 5 to 7 and 11 to 13 illustrate the results presented. However, the aesthetic results should be validated by objective, quantifiable, reproducible and standardized tests²¹. Consequently, the aesthetic improvement presented by patients performs individual and social improvements in self-esteem, attractiveness, sense of well-being and satisfaction related to appearance, increasing the quality of life²¹⁻²³. Aesthetic applications with botulinum toxin have also involved the involution of oral lichen planus lesions¹⁶ and symptoms of depression²⁰. In the present case, remission of the lesions of the geographic tongue was observed, as well as the symptoms presented.

Conclusions

Faced with the various stomatological alterations resulting from COVID-19, the application of botulinum toxin becomes a promising pharmacological agent in cases of symptomatic lesions. The cases must be evaluated and particularized according to the characteristics presented. Besides the suppression of painful symptomatology when present, the aesthetic results may, secondarily, improve the patients' self-esteem and quality of life, favoring the remission of other alterations caused by stress and anxiety, particularly in this pandemic phase.

Conflict of Interest

The authors declare no conflict of interest.

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