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# CASE REPORT: AESTHETIC BENEFITS, RISKS AND ADVERSE REACTIONS OF BOTULINUM TOXIN TYPE A

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**Abstract:** This article reports on a clinical case involving an adverse reaction associated with the application of botulinum toxin type A (BAT) for aesthetic purposes, highlighting the importance of good practices in the handling and administration of this substance. Botulinum toxin, widely used in facial rejuvenation procedures, has proven efficacy and safety, but its inappropriate use can lead to complications. The case involves a 30-year-old patient who presented flogistic signs (pain, redness, heat and edema) in the frontal, glabellar and periocular regions one day after the toxin was applied by a dentist. The bottle used had been open for 20 days, contrary to the manufacturer's recommendations, which may have contributed to the adverse event. After clinical assessment, treatment with prednisone was instituted, resulting in a significant improvement in inflammatory symptoms and complete resolution of the condition in six days. The article discusses the importance of following strict protocols, including proper storage, aseptic technique and individualization of treatment, to prevent complications. Although rare, the occurrence of complications reinforces the need for professional training, informed consent and clinical follow-up. This study highlights the responsibility of professionals to ensure patient safety and the effectiveness of the procedure.

**Keywords:** Botulinum Toxins; Botulinum Toxins Type A; Aesthetics; Complications; Adverse effects; Accreditation.

## INTRODUCTION

*Botulinum* toxin (BT) is a substance obtained from the sporulation of the gram-positive, anaerobic bacterium *Clostridium botulinum*, first identified in 1895 during the investigation of an outbreak of botulism. Its mechanism of action involves inducing temporary neuromuscular paralysis.(1) In the aesthetic field, botulinum toxin is widely used to prevent or attenuate wrinkles and expression lines, especially in the forehead area, between the eyebrows, around the eyes, as well as being applied to other specific points on the face (2, 3).

In recent years, aesthetic procedures for the face and body have become widespread in different areas of health and among the most requested procedures is the use of botulinum toxin type A (BAT) (4). This treatment, widely used in facial rejuvenation and harmonization approaches, is recognized for its efficacy, high satisfaction rate, rapid onset of results and prolonged duration of effects. (1,5) In addition to its aesthetic applications, botulinum toxin is also widely used in the management of clinical conditions such as hyperhidrosis, bruxism, strabismus and blepharospasm (2,6,7).

The use of botulinum toxin in aesthetic procedures is widely recognized as safe and effective. Despite being a minimally invasive intervention, it requires adequate care to prevent possible complications.(3) Although cases of accidental botulism associated with aesthetic use are rare, the procedure offers significant benefits, such as a low risk of complications, rapid recovery and maintenance of a natural appearance (2, 3, 8). However, excessive application or in inappropriate areas can lead to undesirable results, such as facial asymmetry and impairment of essential functions (8, 9). Thus, understanding these aspects is fundamental for a balanced assessment of the benefits and risks associated with the use of botulinum toxin in facial aesthetic treatments.

The aim of this study is to present a clinical case of an adverse reaction with an inflammatory process following the application of botulinum toxin type A for cosmetic purposes.

## CASE REPORT

Patient P.R., 30 years old, married, from the city of São Paulo, state of São Paulo, sought medical attention due to local pain, redness and edema in the frontal, glabellar and periocular region one day after the application of botulinum toxin. The procedure, carried out by a dentist, used Allergan type A botulinum toxin from a bottle that had been open for 20 days. During the application, the patient reported intense pain. The following day, she showed flogistic signs of inflammation, including persistent pain, redness and swelling in the treated areas.

Physical examination revealed obvious signs of inflammation, such as pain, heat, redness and swelling in the affected areas and at each application point (PHOTO 1). The patient was advised to start treatment with prednisone 20 mg orally once a day for five days. No allergies or previous complications associated with aesthetic treatments were reported in the clinical history.

The patient's clinical progress was monitored at appointments two (PHOTO 2) and four days (PHOTO 3) after starting the medication, during which gradual improvement in the inflammatory symptoms was observed. On the sixth day (PHOTO 4), the patient returned for a final check-up, showing resolution of the condition with no signs of complications.




## DISCUSSION

The application of botulinum toxin to the upper third of the face is an aesthetic procedure widely used to soften expression lines, with the additional aim of preventing the appearance of new wrinkles. The region most commonly treated with botulinum toxin type A is precisely the upper third of the face. (10) Sposito (2009) points out that successful treatment with botulinum toxin is intrinsically linked to strict adherence to specific protocols. Proper preparation of the toxin, correct storage, adherence to the instructions on the package leaflet and consideration of the physiological particularities of each patient are crucial factors. Although there are different brands of botulinum toxin on the market, all of them have proven efficacy and safety, with indications clearly defined in their package leaflets.(11) This is in line with the clinical case presented here, since the manufacturer's package leaflet does not indicate storage after opening the seal, and the patient reports that the bottle had already been open for 20 days, which increased and may have contributed to the adverse event.

To corroborate the findings, the prevention of local skin infections, as emphasized by Thanasarnaksorn et al. (2019), involves maintaining a sterile environment and the correct handling of injectable products.(12) However, as shown by Woo Jin Yun et al. (2013), even following strict protocols, adverse reactions such as granuloma can arise, highlighting the complexity of individual responses to procedures.(13)

There are still other types of more serious complications, as reported in the study by De Sousa Martins and collaborators (2022), who presented a case of a patient who developed diplopia, sixth nerve palsy and respiratory tract infections after TBA application.(14) These complications, even if they occur late, highlight the importance of following dosage recommendations and adopting safe protocols, as pointed out by Santos et al. (2017). However, more studies are needed to better understand the relationship between TBA and these adverse reactions, and to establish even more efficient protocols.(15)

The occurrence of ecchymoses, characterized by purplish spots on the skin, is a possible complication after the application of botulinum toxin. According to Sorensen and Urman (2015), the periorbital region is more prone to this type of event due to the delicacy of the skin and the proximity of the blood vessels to the surface. The application technique and the anatomical characteristics of the region directly influence the risk of developing this complication (16).

Headache is a common complaint after the application of botulinum toxin and can be caused by various factors, such as initial muscle spasms, tissue trauma during application and psychological factors. The intensity and duration of the pain varies from person to person, and in some cases can persist for several weeks. According to Kroumpouzos et al. (2021), the treatment of headache after

botulinum toxin application should be individualized, taking into account the intensity of the symptoms and the patient's response to analgesics.(17)

Although rare, infection is a possible complication after botulinum toxin application, especially if the aseptic technique is not strictly followed. Choosing the right products for antisepsis and giving the patient precise instructions on post-procedure care are crucial to preventing contamination of the area. Make-up application should be postponed to allow the microtraumas caused by the needles to heal. According to Witmanowski and Błochowiak (2020), infection can develop into abscesses and leave scars, and antibiotic treatment is essential to avoid these complications (18).

## FINAL CONSIDERATIONS

The use of botulinum toxin, although effective, requires caution and technical knowledge. The procedure must be carried out by qualified professionals, following the rules and therapeutic indications, in order to minimize risks and guarantee patient safety. It is essential that the professional provides clear and detailed information about possible adverse effects, obtaining the patient's free and informed consent.

This case highlights the importance of good practices in the handling and storage of botulinum toxin, as well as having the procedure carried out by properly trained professionals. It also highlights the need for clinical follow-up to properly manage possible complications, ensuring patient safety.

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