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#### Referência

ISAAC, Cassiano Rodrigues; CHALITA, Maria Regina Catai; PINTO, Luciana D. Botox® after Botox®: a new approach to treat diplopia secondary to cosmetic botulinic toxin use: case reports. **Arquivos Brasileiros de Oftalmologia**, [S.l.], v. 75, n. 3, p. 213-214, 2012. DOI: <https://doi.org/10.1590/S0004-27492012000300014>. Disponível em: <https://www.scielo.br/j/abo/a/ST7LZLRScG8bSZswTbGXJdw/?lang=en#>. Acesso em: 8 set. 2022.

# Botox<sup>®</sup> after Botox<sup>®</sup> - a new approach to treat diplopia secondary to cosmetic botulinic toxin use: case reports

## *Botox<sup>®</sup> após Botox<sup>®</sup> - uma nova abordagem para tratamento de diplopia secundária ao uso cosmético de toxina botulínica: relatos de casos*

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### ABSTRACT

A new technique for the treatment of diplopia secondary to cosmetic botulinum toxin A use is described. In this interventional case reports, two consecutive patients who developed diplopia after periocular cosmetic use of botulinum toxin A were treated with intramuscular botulinum toxin A injection into the antagonist extraocular muscle. Diplopia resolved in both patients in less than 1 week with no side effects or complications. In conclusion, the injection of intramuscular botulinum toxin A is an encouraging option for treatment of diplopia secondary to botulinum toxin A use for facial lifting.

**Keywords:** Botulinum toxins, type A/adverse effects; Strabismus; Diplopia; Neuro-muscular agents/administration & dosage; Humans; Female; Adult; Case reports

### RESUMO

Uma nova técnica para tratamento de diplopia secundária ao uso estético da toxina botulínica A é descrito. Nestes relatos de casos, dois pacientes consecutivos que desenvolveram diplopia após uso cosmético de toxina botulínica A periocular foram tratados com injeção de toxina botulínica A no músculo extraocular antagonista. A diplopia melhorou em menos de uma semana nos dois pacientes, sem efeitos colaterais. Consideramos o uso de injeção intramuscular de toxina botulínica A como uma possível opção para o tratamento da diplopia secundária ao uso da toxina botulínica A para rejuvenescimento facial.

**Descritores:** Toxinas botulínicas tipo A/efeitos adversos; Estrabismo; Diplopia; Fármacos neuromusculares/administração&dosagem; Humanos; Feminino; Adulto; Relatos de casos

### INTRODUCTION

For esthetic purposes botulinum toxin A (BTX-A) began to be used in 1990, to reduce the wrinkles caused by muscle facial lines strength<sup>(1)</sup>. Its effect starts three to four days after application and remains four to six months, when, it is believed, regeneration or proliferation of new nerve terminals occurs and promote and re-establish the motor endplate<sup>(1,2)</sup>.

Over 2.5 million esthetic procedures using BTX-A were performed in 2008 in the USA. BTX-A use has been the most popular cosmetic procedure since 2000, and the number of procedures increased 3681% since 1997<sup>(3)</sup>. Consequently, complications have also increased<sup>(1,3-8)</sup>.

Contraction of the lateral orbicularis muscle is responsible for the creation of active lines or wrinkles that radiate from the lateral canthal angle, which are commonly referred to as "smile" lines or "crow's feet". Beside eyelid ptosis, a well known complication, the treatment of these wrinkles with BTX-A can bring an undesirable side effect in extraocular muscles (EOM) causing paralytic strabismus and diplopia<sup>(1,5,9)</sup>. The diplopia generates difficulties to perform daily tasks or work activities.

Paralysis of extraocular muscle can be caused by poor technique, diffusion of BTX-A by the septum or infiltration of large volumes of BTX-A in low concentration<sup>(1,4,6,8)</sup>.

In this report we present two patients followed between November 2009 and September 2010, with diplopia secondary to periocular application of BTX-A for cosmetic treatment of "crow's feet" (Table 1). The purpose of this article is to introduce an alternate technique for the treatment of this complication. Both patients were fully informed

of the risks of this procedure and had signed an informed consent according to the Declaration of Helsinki.

### CASE REPORTS

#### CASE 1

A 41-year-old woman, who had BTX-A application in the face 10 days before, presented with diplopia starting one day prior to consultation. The dosage that was used was not known and she denied systemic pathologies. Best corrected visual acuity was 20/20 in both eyes. Cover test with prisms, left eye (LE) fixing, showed in primary position esotropia of 14 prism diopters (PD) which increases in right gaze and diminishes in left gaze. 10 days after onset of diplopia she was treated with Botox<sup>®</sup> (Allergan, Irvine, CA) application into the right medial rectus muscle (2.5 U - 0.05 ml) with topical anesthesia and Mendonça's forceps. Seven days after the procedure she described diplopia only on extreme lateroversions. Three months post BTX-A intramuscular injection she remained asymptomatic and recognized stereoacuity of 40 s arc at Titmus test.

#### CASE 2

A 53-year-old woman, complained of diplopia noticed 14 days after BTX-A application for wrinkle elimination. The dosage that was used was not known. Three days after development of symptoms she was evaluated by an ophthalmologist. Prior to this, she underwent a complete neurological evaluation that was normal. Ophthalmic

Submitted for publication: July 7, 2011  
Accepted for publication: February 15, 2012

Study carried out at Centro Brasileiro da Visão - CBV - Brasília (DF), Brazil.

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**Funding:** No specific financial support was available for this study

**Disclosure of potential conflicts of interest:** C.R.Isaac, None; M.R.C.Chalita, None; L.D.Pinto, None.

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**Table 1. Cases description, injured muscle and performed treatment**

	Start of diplopia*	Injured extraocular muscle	Eyelid ptosis	Treatment performed	Improvement of diplopia
Case 1	9 days	Lateral rectus	Absent	Botox® application in MR**	Total recovery 7 days after treatment
Case 2	14 days	Bilateral lateral rectus	Absent	Botox® application in MR**	Total recovery 2 days after treatment

\*= days after BTX-A application for facial esthetic treatment

\*\*= MR medial rectus

examination revealed low myopia and best corrected visual acuity of 20/25 in both eyes. Cover test with prisms showed in primary position esotropia of 14 PD when right eye fixing and esotropia of 18 PD when left eye fixing. Ductions showed slight limitation (-1) of lateral rectus muscles of both eyes. The rest of the ophthalmological exam was unremarkable. Occlusive treatment was not tolerated by the patient. Faced with major complaints by her diplopia we proposed and carried out (12 days after symptoms onset) Botox® application of 2.5 U (0.05 ml) in the right medial rectus muscle with topical anesthesia and Mendonça's forceps. Two days after treatment she described total recovery of diplopia and at subsequent evaluations she remained asymptomatic. Stereoacuity of 40 s arc (Titmus test) and no movements on cover tests were observed.

## DISCUSSION

The use of BTX-A for treatment of diplopia secondary to cosmetic BTX-A application was effective. To our knowledge, there is not similar data published in the literature.

The intervention and follow-up of two patients with diplopia started 9 and 14 days after BTX-A application for facial esthetic treatment of crow's feet. They reported significant discomfort and difficulty in performing their daily and work activities.

In both cases we found esotropia secondary to paresis of lateral rectus muscle probably by diffusion of BTX-A applied into the orbicularis muscle at lateral canthus.

Patients had their diplopia treated with BTX-A application into their medial rectus muscle, antagonist of the muscle that was affected by cosmetic procedure (lateral rectus). They presented a rapid improvement of symptoms (7 and 2 days after treatment). Usually, the time of improvement with expectant management occurs around 7 to 10 weeks after cosmetic treatment<sup>(6)</sup>. Shortening the duration of diplopia can lead to an important positive impact in the quality of life of patients.

We performed this treatment only in cases which there was a recent involvement of the lateral rectus muscles. This made planning easier because this treatment is similar to that used for treating cases of sixth cranial nerve palsy.

By choosing the same drug used in the procedure that caused the diplopia and performing treatment a few days after the first procedure, we believed that the time in which the muscles suffer toxin

effect would be similar. This actually occurred and the patients were asymptomatic throughout the postoperative follow-up.

From the foregoing, the authors propose that patients that will undergo a procedure with BTX-A for cosmetic purposes should be warned about the possibility of developing postoperative diplopia. If this occurs, referring the patient to an ophthalmologist as soon as possible is imperative for appropriate management. The ophthalmologist should be experienced in the treatment of strabismus and should define the best treatment choice for each case, which could be a conservative management, use of ocular occlusion<sup>(8)</sup>, glasses with prismatic lenses or use of BTX-A injection into the antagonist muscle as described in this article. Further studies are needed to confirm efficacy and safety of this new therapeutic approach.

## LITERATURE SEARCH

A PubMed literature search from 1980 to present was completed to identify existing reports of complications with the use BTX-A for esthetic and its treatment. Search terms included *botulinum toxin complications, strabismus, diplopia, esthetic*. Articles references in papers and standard textbooks were also consulted.

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