GUMMYSMILETREATMENTWITHBOTULINUMTOXinandREVIEWofLITERATURE-ACASEREPORT

BOTULİNUMTOKSİNELGUMMYSMİLETEDAVİSİVE LİTERATÜRDERLEMESİ-OLGUSUNUMU

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ABSTRACT

Aim: In this case report, Botulinum Toxin’s application methods, advantages, disadvantages, indications and contraindications are discussed at the literarcy.

Case and Method: A 29-year-old woman came to our clinic with the complain of excessive gingival display on smiling. She was systemically healthy and she had no drug usage. 5 mm of gingival display W when smiling was diagnosed. After clinical examination, it was recorded that her gummy smile was due to hyperactive lip elevator muscles. Botulinum Toxin(Botox; Allergan Inc, Westport, Ireland) is applied according to manifacturer’s instructions.

Results: After 1 week of the Botulinum Toxin injection the excessive gingival exposure is decreased 3.5 mm at the patient.

Conclusion: Gummy smile(GS) is an aesthetic disorder for some patients that is seen due to several factors which has some different treatment options such as orthognatic surgery, orthodontic treatment, gingivoplasty and bone resection. Latterly, Botulinum Toxin is also being used at gummy smile cases as a minimal invasive treatment alternative to decrease excessive gingival display.

Keywords: Botulinum toxin, botox, gingival exposure, gummy smile

INTRODUCTION

Smile aesthetics is influenced by 3 factors: teeth, gums and lips.1,2 An aesthetical smile depends on those 3 components’ proportions and arrangements.3 In a person with an attractive smile, the upper lip should symmetrically expose up to 3 mm of gum.4 If the exposure of gum is more than 3 mm during smile, this condition is called Gummy smile(GS). Gummy smile is one of several developmental or acquired deformities that is apparent in periodontium.4 It’s prevalence at population is between 10.5%5 and 29%6 and it is more prevalent in females.7

Gummy smile has several etiologic factors such as skeletal, gingival, muscular and their combination.8

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Those factors include vertical maxillary excess, anterior dentoalveolar extrusion, altered passive eruption, short or hyperactive upper lip. Botulinum toxin has wide range of treatment conditions including strabismus, cervical dystonia, blepharospasm, hemifacial spasm, hyperfunctional larynx, juvenile cerebral palsy, spasticity, pain and headache, occupational dystonia and writer’s ramp. In dentistry it can be used at temporomandibular disorders, myofacial and neck pain, oromandibular dystonia and bruxism, headache, migraine, trigeminal neuralgia, gummy smile, masseteric hypertrophy and before dental implant surgeries for better osseointegration. In this case report, we aimed to emphasize BTX-A injection, a minimal invasive treatment method on a patient with gummy smile.

**CASE REPORT**

A 29-year-old woman came to our clinic with the complaint of excessive gingival display on smiling. She was systemically healthy and she had no drug usage. 5 mm of gingival display on smiling was diagnosed. After clinical examination, it was recorded that her gummy smile was due to hyperactive lip elevator muscles. BTX-A (Botox; Allergan Inc, Westport, Ireland) is applied as a freeze-dried powder of 100 U, was reconstituted with 2mL normal saline (0.9%) solution to make 5.0U/0.1mL dose according to manufacturer’s instructions. Injection sites were determined by muscle animation (smiling) and palpation to ensure precise muscle location. The gingival display was reduced 3.5mm after 1 week of injection. The patient is also advised not to lie down, do exercise, or massage the treated area during first 4 hours after procedure.

There are 4 different types of GS: 1) Anterior GS; more than 3 mm of gums are exposed between canine teeth, which involves the action of levator labii superioris alaeque nasi (LLSAN) muscles. 2) Posterior GS; in which more than 3 mm of gum is exposed posterior to canines, that involves the action of zygomatic muscles. 3) Mixed GS; in both anterior and posterior there is excessive gingival display that involves two or more muscles’ actions. 4) Asymmetric GS; is seen on one side that is caused by asymmetric contraction of LLSAN or zygomatic muscles. In our case, patient has anterior GS. Thus, the injection site is determined lateral to each nostril and 4U of Botox is injected. This provides vertical relaxation of upper lip but maintains the ability to smile and pout the lips. Another injection of BTX-A should be done after approximately 6 months.

Generally 1 ml insulin syringes with removable 30 gauge needles are used for BTX-A injection. Those needles are not traumatic and does not cause any pain because of their size. Usually local anaesthesia is not necessary. There is still debate that if the skin should be prepared before injection or not. There are no evidence-based consensus on whether the skin should be disinfected with alcohol or chlorhexidine to prevent infection but this should be avoided due to the interaction between alcohol and BTX-A. Gummy smile can be treated with orthognatic surgery, modified lip repositioning technique, crown lengthening. Recently Botulinum toxin injection has been started to use as a minimal invasive alternative. If the etiologic factor is skeletal and patient is willing to have a surgery there are some different kinds of surgeries for GS. Rubinstein and Kostianovsky described a procedure in which elliptical portion of gingiva and buccal mucosa is excised and...
the approximated borders are sutured together. Litton and Fournier applied a treatment in which they bring the lip down by muscle detachment from the bony structures above. Silva et al. investigated the modified lip repositioning technique at patients with gummy structures. Subjects were satisfied with the results but nevertheless they are surgical techniques and have some complications like limited morbidity and mucocele formation. Surgical procedures may result in frequent relapse and undesirable side effects such as scar contraction. Botox injection is less invasive than surgical techniques. Also, if it is not used in high amounts the adverse effects are seen very rarely. However, there are some adverse effects of Botox injection including infection, bruising, edema, loss of muscle strength, facial nerve palsy, dysphagia, hematoma and flu-like symptoms. Moreover, injection site should be carefully located. Unless, asymmetric smile and inability to pucker can be seen. Botox A has wide range of treatment options. On the other hand, in some cases its’ usage is contraindicated. Administration of Botox A should be avoided during pregnancy, breast-feeding, patients with neuromuscular junction disorders (Myasthenia gravis, Lambert-Eaton syndrome) and neurodegenerative diseases (amyotrophic lateral sclerosis). Due to the effect of aminoglycoside antibiotics to Botox A, its applying should be avoided. Furthermore, Botox A may have drug interactions with calcium channel blockers, cyclosporine and cholinesterase inhibitors.

Another point that should be careful is not to administer high frequent of Botox A (more than 12 weeks) because repeated exposure can result in formation of neutralizing antibodies against the toxin that can lead to disappointing results.

The dosage of Botox A injection is very prerequisite. Between females and males, the dosage is different relating to muscle volume. In general, males have a larger muscle volume and require more units of Botox A to achieve the same results as female patients. The injection dose differs among studies. Polo applied multiple injection into each elevator muscle with doses ranging from 0.625 U to 2.5 U at different phases. Garcia found that 2 to 5 U of Botox A is effective as higher doses. High dosages of application of Botox A injection should be avoided because of side effects. The lethal dose of Botox in humans is not known but it has been estimated nearly 3000 U.

For getting the best results, Botox A should be kept according to the manufacturer’s instructions. Once opened, the drug must be stored at temperature of 2-8°C. Also, it should be used within 4-8 hours. Those recommendations are for sterility and efficacy of drug. However, in some studies it has shown that toxin’s efficacy remains same until 15 days after reconstitution and no bacterial contamination occurs.

Despite of some adverse effects and reversibility of Botox A via regeneration of nerve-muscle complex and SNAP-25 proteins, Botox A injections seems to be the least invasive treatment option for gummy smile cases.

**CONCLUSION**

Botulinum toxin has been popular and has been started to be investigated extensively at dentistry for several cases. It is more preferred from patients with gummy smile due to the minimal invasiveness.

However, dentists should start to apply Botox A injection at perioral area after a detailed education programme to avoid adverse effects and malpractice cases.

**REFERENCES**


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