

**Botulinum Oxide And Its Use In Orthodontics**

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**Abstract**

Botulinum toxin type A is effective in reducing excessive gingival display caused by hyper functional upper lip elevator muscles; however, this effect is transient. A pleasant smile is important for socialization, because one conveys a sense of joy through facial expressions. In an agreeable smile, the border of upper lip must be symmetrically arrayed over up to 3mm of gingiva, and the gingiva line must follow the contour of upper lip exposure. Displaying more than 3mm of gingiva on smiling is called “Gummy Smile” and is therefore considered an aesthetic disorder.

This article discusses the uses of Botox in correcting gummy smiles, preserving smile esthetics and the various uses of Botox in daily life as well as orthodontics.

**Keywords:** Botulinum toxin, gingival display and smile esthetics

**Introduction**

As society becomes more esthetically conscious orthodontics are more challenged to produce not only

outstanding occlusions but also outstanding esthetics every minute detail is becoming more important in separating the good from the orthodontist recent studies indicated that the amount of gingival<sup>1</sup> display on smiling is very important to smile attraction. In fact, the amount of gingival display is an important characteristic in a person own satisfaction with their smile.

The display of excessive gingival tissue in the maxilla upon smiling or gummy smile is both an oral hygiene and cosmetic issue<sup>2</sup> with no simple remedies.

Excessive gum exposure is frequently attributable to own contraction of the upper lip muscle particularly elevator labia superiors Alaquenasi.

Although Several surgical technique have been reported in the literature terminal for the correction of hyper functional upper lip elevator smile muscles such as Rubenstein and kostianeusky, miskinyar<sup>3</sup> and la trena techniques they are not routinely used to treat a gummy smile In general most surgical corrections currently used are the le fort I osteotomies with impaction for skeletal

vertical maxillary excess and gingivectomies for delayed passive dental eruption with excessive gingival display<sup>4</sup>.

Some patients do not wish<sup>5</sup> to go through the long pre surgical orthodontic treatment in preparation for a le fort I osteotomy. Other wish to avoid the possible complications surrounding surgery such as postoperative pain, swelling and infection permanent or temporary nerve damage, root damage during osteotomy, surgical or orthodontic relapse, possible need for blood transfusion and finally a less than optimal occlusal outcome. A Non-surgical alternative for reducing examines gingival display caused by muscle hyper function would be advantages.

Botulinum toxin (BTP) has been under the clinical investigation since the late 1970's for the treatment of several condition associated with excessive muscle contraction<sup>6</sup> or pain.

Furthermore, it is the first-choice treatment for wrinkles located on the upper third of the foci. BTX is also underly used in the precaution and correction of changes caused by muscles contraction in the middles and lower third<sup>7</sup> of the face and neck, including a gummy smile<sup>8</sup>.

### **Botulinum Toxins**

BTX, a natural property, is one of the most protect biological substances known. The toxin inhibits the release of acetylcholine, a neurotransmitter responsible for the activation of muscle contraction and glandular secretion.

Administration of the toxin results in a reduction of tone in the injected muscle. Some nerve terminals are not affected by the toxin, allowing the injected dystonic muscle to contract, but with less force.

This weakness allows for improved posture and function of the hypertonic muscle. The degree of weakening depends on the dose, and the duration of weakness is dependent on the serotype of btx employed.

### **Patients should not be treated or treated with the extreme caution who are:**

1. Psychologically<sup>9</sup> unstable or who have questionable motives and unrealistic expectations
2. Dependent on enact facial movements and expressions for their livelihood (eg: actors, singers, musicians and other media personalities
3. Affected with a neuromuscular disorder
4. Allergic to any of the components of BTP-A or BTP-B
5. Taking certain medications that can interface with neuromuscular impulse transmission and potentiate the effect of BTX

### **Pregnant or lactating**

Local effect of BTP is generally transient hypersensitivity reactions have not been described at present no long-term complications of Botox therapy have been identified. Some short term, unwanted side effects are pain, bruising, weakness of adjacent muscles, ptosis, delayed eyelids closure, decreased blink response excessive tearing, as ymmetry of the face, headache, antibody development and necrotizing fasciitis. According to server, a slight amount of gingival exposure is acceptable and that contrary to posed smile<sup>10</sup>, and un-posed smile is natural in that it expresses authentic human emotions

The best orthodontically treated subjects may not be satisfied by the treatment of soft tissue problem is not corrected. Botox is indicated when the gummy smile is due to hyper functional upper lip elevator muscles and Botox is an excellent non-surgical alternative.

Botox is a Conservative, safe minimally invasive treatment modality to achieve enhancing aesthetic results. The procedure is to be performed by a dermatologist who is also a Botox certified physician. BTx-A was diluted according to the manufacturers

recommendation to produce 2.5 units per 0.1 ml by adding 4.0 ml normal saline solution to 100 units of vaccine dried clostridium BTx-A.

Dentist and orthodontist administer injections after training.

### **Benefits of Botox and fillers for the orthodontic patient**

Botox, in addition to great cosmetic benefits has also therapeutic benefits<sup>13</sup>. It is the most common noninvasive cosmetic treatment. It comes in the form of injectable medication that is used therapeutically to reduce the strength of targeted muscles.

It works by blocking the signals from nerves to muscles which prevents contraction. This causes wrinkles and often beyond the aesthetic applications. Botox has also proven useful in treating many medical conditions.

### **Therapeutic benefits of Botox<sup>14</sup>**

Botox is approved for over 20 different medical conditions namely

- 1) Blepharospasm (spasm of the eyelids)
- 2) Idiopathic rotational cervical dystonia (Severe neck and shoulder muscles spasm)
- 3) Chronic migraine
- 4) Teeth grinding and or clenching
- 5) Strabismus
- 6) Post stroke upper limb spasticity
- 7) Hemifacial spasm
- 8) Bell's palsy

### **Aesthetic benefits of Botox**

With Botox being such a convenient and non-surgical treatment to maintain youth and beauty it is no wonder it is popular.

### **Benefits of Botox cosmetically include**

1. Reduces fine lines and wrinkles in forehead, neck and around the mouth<sup>15</sup>.
2. Lifts droopy brows

3. Gives a refreshed appearance and enhances a beautiful smile.

4. Can reduce a gummy smile<sup>16</sup>

5. Give fullness to lipobotox-neutles

There are five common myths such as:

1. Botox is a poison –many are under the impression that Botox is harmful to the body<sup>17</sup>but it would take 2500 –3000 units or 25-30 vials to deliver a lethal dose

2. Botox will give you a frozen look. As long as you are receiving the Botox application by an experienced doctor who knows the correct amount of Botox to inject, one will have a fresh and natural looking face.

3. Botox will erase all wrinkles<sup>18</sup>. There are two types of wrinkles that are dynamic and static.

4. Botox treats dynamic<sup>19</sup> wrinkles by releasing the muscles thus improving the appearance of these wrinkles, however static wrinkles do not respond to Botox and required further aesthetic treatment

5. Botox is used for aesthetic reasons. Although Botox is widely used for aesthetic reasons, it is used for many therapeutic and radical treatments. Many times, you cannot even separate the two.

6. Results can be seen 7 to 12 days after.

### **Uses of Botox:**

1. Used for cosmetic procedure<sup>20</sup>

2. For pain management particularly caused by TMJ disorders

3. For bruxism

4. For reduction gummy smiles Treatments are painless and take 2 to

5 minutes and the results last between 3 to 4 months.

### **Facial areas for the injection**

1. eye wrinkles 2. eyebrow lift 3. forehead lines 4. frown lines<sup>21</sup> 5. smile line 6. nasolabial fold 7. dimpled chin 8. square jaw 9. jaw lines 10. neck lines.

## Discussion

Polo conducted a study on 30 patients received BTx-A injections to reduce excessive gingival display. Patients were followed at 2,4,8-,12-, 16,20- and 24-weeks past injection, with changes documented by photography and videos. At week 2, patients rated and evaluated with the effector of BTx-A. The various studies stated that BTx-A injections for neuro muscular correction of gummy smiles excused by hyper functional <sup>11</sup>upper lip Elevator Muscle were effective and statistically superior to baseline smile, although the effect is transitory.

Sandler et al treated a female patient of age 35 with gummy smile and the result showed that the BTx-A injections for the Neuromuscular correction of gummy smiles caused by hyper functional upper lip <sup>12</sup>Elevator muscles were effective minimally invasive and temporary treatment outcome.

Patel et Al conducted study on to subject's age from 18 to 23 years with excessive gingival display due to hyper functional upper lip Elevator muscles were treated with BTx-A injections, and the patients were evaluated clinically after 3 days, 7 days, 14 days, 15 days, 2 months, 2.5 months, 4.5 months and 6 months.

The study concluded that the treatment modality was effective producing aesthetically acceptable smiles in these patients, and the improvements lasted 3 to 6 months.

Amen et al reported a case in which the patient with excessive gingival display was treated with BTx-A injection and it was concluded that the use of Botox is conservative treatment in the patient with short upper lip and gummy smile. However, the improvement is temporary and must be repeated every six months to one year.

Hyper function of the upper lip Elevator muscles (Levator labi superioris, alaeque nasi, Levator angular oris and the zygomaticus muscle) can all play a major etiological role in a gummy smile. Thus, concise evaluation of etiology, diagnosis and implementation of treatment outcome. Thus ability of BTx-A to produce muscle paralysis by chemo observation has been utilized to treat the patient teeth hyperactive upper lips, The only disadvantage is that treatment with Botox is not permanent option, unlike other surgical alternatives.

The effect of this treatment is for short term usually for 6 months, and the patient has to get it redone after that. It is important to note that injection of Botox should not give frequently before the effect of further treatments.

Moreover, the treatment might sometimes produce asymmetrical results due to injection at wrong site or by an un-experienced clinician, and the Cost is also high for such a treatment. Injection with BTA – A provides minimally invasive, temporary empowerment of gummy smile for patients with hyper functional upper elevator muscles.

## Conclusion

Botulinum toxin types (bta) has been studied since the late for the treatment of several conditions associated with excessive muscle contraction. Smile aesthetics<sup>22</sup> has become a major concern among patients and orthodontist for gummy smile correction botulinum toxin injection is thought to be an alternative method because it is effective and conservative method and it has high patient satisfaction.

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