

Botox : Role in Dentistry

Dr. Ajay Kumar Gupta

Reader
Department of Orthodontics
Krishna Dental College, Ghaziabad

Dr. Amit Kumar

Reader
Department of Oral surgery
Harsaran Das Dental College, Ghaziabad

Address for Correspondence :

Dr. Ajay Kumar Gupta
Reader, Dept. of Orthodontics
Krishna Dental College, Ghaziabad
drajaygupta04@gmail.com

Introduction

Most dentists are not aware of the considerable benefits that Botox has in therapy for cosmetic and dental treatment. There are many innovative, minimally invasive uses being found for Botox in dentistry. It is certainly time to recognize that dentists can be just as proficient in injections than any of these healthcare providers as dentists have much greater expertise in the oral and maxillofacial areas and are also trained to be experts in the muscles of mastication and the muscles of facial expression, which routinely receive these treatments.

What is BOTOX

Commercially available botulinum toxin is the purified exotoxin of the anaerobic bacteria, Clostridium botulinum. Allergan's BOTOX (Botulinum Toxin Type A), a protein derived from the Clostridium botulinum bacterium, has both therapeutic and cosmetic applications. It is a stable, sterile, vacuum-dried powder that is diluted with saline solution, without preservatives, for injection.

The total "dose" of BOTOX® in each vial is always 100 units but different amounts of saline solution can be used with each vial depending on the intended use-

Mechanism of Action

Currently, seven botulinum neurotoxin serotypes (A, B, C1, D, E, F, and G), produced by Clostridium botulinum, are recognized. Although all inhibit acetylcholine release, their intracellular target proteins, the characteristics of their actions and their potencies vary substantially. At the neuromuscular junction, the inhibition of acetylcholine release by botulinum toxin type A blocks or reduces the contraction of muscles, an effect which has been used therapeutically in disorders characterized by overactive muscle activity.

The toxin acts by preventing the release of acetylcholine from pre-synaptic vesicles at the neuromuscular junction resulting in an inhibition of muscular contraction. This blockade is temporary, varying from three to four months, after which sprouting of new axon terminals result in a return of neuromuscular function. Therefore, treatment with botulinum toxin cannot be considered curative but a palliative and

symptomatic approach to the management of a problem. The toxin has also been shown to block acetylcholine release at parasympathetic nerve terminals.

BOTOX in Dentistry

As BOTOX use became more prevalent, general dentists began to use it to treat dental problems and These days, more and more dentists are offering cosmetic treatments to their patients.

Uses in Dentistry

1. Temporomandibular disorders
2. Masseteric hypertrophy
3. Hemifacial spasm
4. Myofascial pain
5. Bruxism
6. Trismus, sialorrhea
7. Retraining muscles during orthodontic therapy, in patients with a very strong musculature.
8. Training the patient to get used to new dentures, especially in patients with strong irregular muscle contractions.
9. Jaw line contouring by injecting into masseter muscle thus weakening it and some bulk of this muscle is reduced, resulting in a more tapered jawline.

Botox has useful clinical uses as an adjunct in bruxism and temporo-mandibular joint (TMJ) cases, even more so for patients with chronic facial and TMJ facial pain.

When Botox is typically given in half the amount that is normally used for a smoothing treatment for facial wrinkles, it can greatly decrease the strength of the muscle contractions that contribute significantly to facial and TMJ pain and provide dental patient significant pain relief.

Botox is frequently used with other dental therapy as a nonsurgical alternative to high lip line (GUMMY SMILE) cases. The treatment that most dentists have been trained to deliver to these patients would be some kind of periodontal flap surgery. Gummy smile treatment with onabotulinum toxin A into the levator labii superioris alaeque nasi muscle is an effective method, with minimum risk of complications and very high patient satisfaction.

Another common use of Botox is to shrink the size of the masseter muscle in subjects with benign masseteric hypertrophy. Several studies of this technique have shown

successful reduction of the "bulging" masseter muscles in these types of "square-faced" subjects.

Other Orofacial Pain Disorders

There is still inadequate, well controlled research on the effectiveness of botulinum toxin in most other orofacial and related conditions. In some cases, the results are in conflict. Although research is still ongoing, there may be a place for it in the management of some forms of headache, migraine and tension type in particular where the more common therapeutic modalities have been unsuccessful.^{19,20,21} Its value in orofacial neuropathic conditions is yet unproven. Again, patients should be informed of these off-label applications before making an informed decision.

Dental Implants and Surgery

Oral and maxillofacial implants and fracture repair often require multiple fixation sites and hardware to overcome the strong forces of masticatory musculature. Overloading of these muscles can prevent or impede osseointegration of implants and/or fracture callus formation. The muscular relaxation achieved with botulinum toxin type A injections to the masticatory muscles can be therapeutically beneficial by allowing implant structures better unimpeded integration and fracture healing in a more stable environment.

Kayikvioglu and colleagues conducted a small open-label study to prospectively examine the use of botulinum toxin type A as an adjunct to zygomatic fracture fixation surgery, in an attempt to reduce the number of fixation sites and to prevent dislocation of the zygomatic bone. Five male patients with zygomatic bone fractures were injected with 100 U of botulinum toxin type A into the masseter muscle of the fractured side. Patients were then operated on 12 to 48 hours after the injection and EMG confirmation of muscle denervation. The temporary paralysis of the masseter muscles allowed for fewer miniplate and/or microplate insertions in all patients, and resulted in no complications related to either the botulinum toxin injections or surgical procedures. Kayikvioglu's group also found similar benefits of adjunct botulinum toxin treatment for surgical reduction of mandibular and





Save the Girl Child

“Girls are diamond. Shape her for the betterment of the generation”

- Afzal A. Zaidi

Managing Editor (Heal Talk India)



Becoming a mother is the greatest gift of God and a girl child is God's gift. A baby girl is one of the most beautiful miracles in life, one of the greatest joys we can ever know, and one of the reasons for an

extra sunshine, laughter and happiness in our life today. I can vouch for this as this was exactly what I felt when I held my daughter in my arms for the first time way back in 1988. She was the brightest light in my life and

my bundle of joy. I would look at her face whenever I felt sad or dejected with my life, and my sadness would vanish. I was doing my masters (MDS) in Pedodontics and Preventive Dentistry from KGMC, Lucknow at that time.

I wish to recall at this point that I am also the only daughter of my parents. They would never look me down over my two brothers. They brought me up at par with my two brothers; I had equal opportunities in education, sports, facilities and all other opportunities in life. They gave me freedom equal to my brothers. I was a bright student and a fast learner and my parents always felt proud of me. They even allowed me to pursue my higher studies in a foreign university. Despite the fact that I belonged to the state of Bihar, where mostly

daughters were made to predominantly focus on household work with bare minimum education, my parents encouraged me to move ahead in my professional career and cultural and social circle. There was no discrimination between the sons and daughter.

When my daughter was growing up I sensed the same potential in her. She was a bright and vibrant child whom I always felt proud of. Today after completing her Graduation in Dentistry from Mumbai, she has done her Master of Science from

McGill University, Montreal, Canada and now is doing PhD from the same university. She has niched a sound position for herself in the university and is everyone's dear. I am really very proud of her and am thankful to GOD almighty for blessing me with such a fantastic daughter. I am also proud to state that my daughter is every family member's darling. Her father and grand parents dote on her.

“Daughter is the knot that ties the families together”. **A girl child is God's gift, nurture her like a flower.**

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condylar bone fractures.

How often do Patients Need to Return for Additional Injections?

According to Allergan, the effects of BOTOX injections last up to six months. It is important not to give injections prematurely (before the effects of the treatment have worn off), as this can result in a buildup of antibodies to BOTOX that would dilute the effect of further treatments.

Safety & Adverse Effects

Botulinum toxin has high affinity receptor binding to cholinergic nerve endings and enzymatic specificity, which leads to a low adverse-event profile. In general, adverse reactions are uncommon and relatively mild and transient. They are more common at or near the site of injection. These include dry mouth, dysphagia, dysphonia, transient muscle paralysis, headache, urticaria and nausea. Often, but not always, these side effects are noted when the dose exceeds that recommended. Although the drug is considered generally safe, there are a number of uncommon, relatively mild adverse reactions but more recently, some severe, potentially life threatening side effects, distant from the site of injection have been described. Most of the conditions for which a dentist might use botulinum toxin are not amongst the approved applications (off-label use). Therefore patients should be properly informed prior to consenting.

Contraindications

1. During pregnancy or while breast feeding
2. Presence of inflammation or infection at the site of proposed injection
3. Anyone with known hypersensitivity or allergies to human albumin, BOTOX toxin, or saline solution.
4. Anyone with known motor neuropathy, neuromuscular disorders such as amyotrophic lateral sclerosis, myasthenia gravis, Lambert-Eaton Syndrome, muscular dystrophy, multiple sclerosis etc.
5. Anyone taking Aminoglycoside antibiotics because aminoglycosides may interfere with neuromuscular transmission and potentiate the effect of BOTOX therapy.
6. Anyone taking Calcium Channel Blockers.

Disadvantages

1. Short term effect
2. Asymmetrical/unnatural appearance of smile sometimes due to improper injection technique.
3. Cost factor

Conclusion

Though more extensive confirmation of its use in multiple dental applications is needed, it is evident that the potential use of botulinum toxin in the dental profession can be of great value. Botulinum toxin in the dental office offers a reversible alternative to

more aggressive procedures such as full-mouth reconstruction, orthodontics, and orthognathic surgery.

BOTOX therapy is a conservative, minimally invasive treatment that can expand our therapeutic options for the benefit of our patients and is a natural progression of where we are going in the dental industry The practitioner must ensure that the treatment is within his or her scope of practice and that he or she has the appropriate training, not only to administer the drug but to deal with potential adverse effects. These procedures are easy to accomplish by general dentists with proper training, and it seems inevitable that these be included someday in the general dentist's scope of practice.

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