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Roadmap of Botox and derma fillers in dentistry

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Abstract

In recent years, derma fillers and botulinum toxin have entered dentistry for both cosmetic and therapeutic uses. They are here to stay, and with more and more intraoral uses, they are quickly replacing other dental treatments as a necessary component. They provide the most crucial, inexpensive, and downtime-free minimally invasive operations. With today's procedures for rejuvenation and aesthetics, derma fillers and botox are combined. In this article, the many applications of Botox and derma fillers in the maxillofacial regions are explored, along with their potential future applications in dentistry.

Keywords: roadmap, derma fillers, potential future applications

Introduction

The smile is the primary facial expression of happiness, pleasure, and good mood and represents an important aspect of socializa-tion. The smile is arguably one of the most influential human emotional expressions in interpersonal relationships.

An aesthetic smile is dependent on the proportions and relationships of the structures that comprise the lower face: the teeth, the vermillion and soft tissues of the lips, and the gingiva. The chief complaint of an unaesthetic smile has become an area of expertise for the dentist, and is commonly addressed with a focus on dental modification, including orthodontic and orthognathic correction, and periodontal surgery for gingival or soft tissue alteration.Less emphasis has been placed on the muscular and functional components of smiling in the treatment planning phase of smile modification.

Nowadays Botox and Derma Fillers have been used to provide a useful three Dimentional look. Optimum result of esthetic dentistry are limited by the condition of the facial tissue surrounding the mouth making it imperative for the dentist to integrade botox treatment in their practice.

Botox, also known as botulinum toxin-BTX or botulinum neurotoxin, is a protease exotoxin produced by the gram-positive, rod-shaped,spore-forming, mobile, anaerobic bacteria. It has a long history of usage in both medicine and beauty. The scientific research on the use of Botox to treat dental issues is reviewed here.

Whereas Gel-like compounds called dermal fillers are injected under the skin. Moreover, it softens wrinkles and improves the contour of the face. Dermal fillers may hold promise for cosmetic dentistry and have significant clinical applications. An aesthetic surgeon's arsenal of tools for treating ageing skin should include dermal fillers.

History

The phrase "Sausage poison" was first used to describe the botulinum toxin by German physician Justinus Kerner in the years 1786–1862. In 1870, John Muller, a different German doctor, first used the word "botulism." Burgen conducted experiments on monkeys in 1949 and established that the toxin can disrupt neuromuscular transmission. In the year 2000, Botox was licenced for the treatment of cervical dystonia. Two years later, it was also approved for the reduction of frown lines between the brows.

Methods of facial Rejuvination

- Neuromuscular agents. (BOTOX)
- Filler material intra dermal and subdermal

Botulinum toxins

Botulinum neurotoxin A (BT-A) is a commercially available preparation of the neurotoxin produced by the bacterium Clostridium botulinum. Subdivided into eight types A,B, C(C1,C2),D,E,F,G and H.

Botulinum toxin, however, has two sides. The first toxin to be approved for medicinal purposes is botulinum. The range of therapeutic uses for BTs has expanded since Scott used them for the first time to treat strabismus and continues to this day. From A through G, there are seven main varieties of BTs. Only BT types A (BTA) and B (BTB)—two of the commercially available variants-are offered under various brand names. The use of the BoNT/A and BoNT/B [1] specifications was approved by FDA. These days, a lot of dentists all around the world provide their patients botulinum toxin (also known as Botox). Botulinum toxin, also called as a "miracle poison" is the most potent biological toxin. It has become a powerful therapeutic tool in the field of medicine and various uses of this toxin in dentistry are under active research.

Dosage

The amount of BT needed to treat a specific ailment depends on the brand or preparation used because each product has a different unit of measurement. Patients receiving therapeutic intramuscular injections have

experienced cases of botulism [2]. BTA, however, has been used in clinical settings since 1967, and its safety is well known.

Botox® and Dysport® are the two forms of BTA that are most frequently accessible. 80 units of Dysport® are equivalent to about 20–25 units of Botox®. Botox® is sold as sterile, single-use 100 or 200 unit vacuum-dried powder that must be reconstituted with sterile, preservative-free 0.9% sodium chloride injection USP before being injected [3]. It is advised that the reconstitution be done gently because froth produced by excessive shaking can cause the toxin's surface to become denaturized.

When not in use, BT is kept in a frozen vial (2-4°C). Injections are made by mixing 4 ml of 0.9% preservative-free normal saline solution, and the mixture must be used within 4 hours.

Mechanism of action

Overactive muscles see a reduction in muscular activity after receiving an injection of botulinum toxin-A. The toxin at the neuromuscular junction inhibits the release of acetylcholine, which causes a reduction in the strength or elimination of the muscle contraction altogether. The botulinum toxin inhibits the acetylcholine from attaching to the membrane where the neurotransmitter is released since it is held in the vesicles.

At around three to four months after the toxin's effects have worn off, the muscle begins to initiate new acetylcholine receptors and forms a new synaptic chain from the development of branches from the neurons. Over time, the muscles resume their original roles without experiencing any negative effects [4]. High dosages of botulinum toxin may cause full paralysis of the muscles, while therapeutic amounts may cause partial activation, which also lessens hyper functional wrinkles [5].

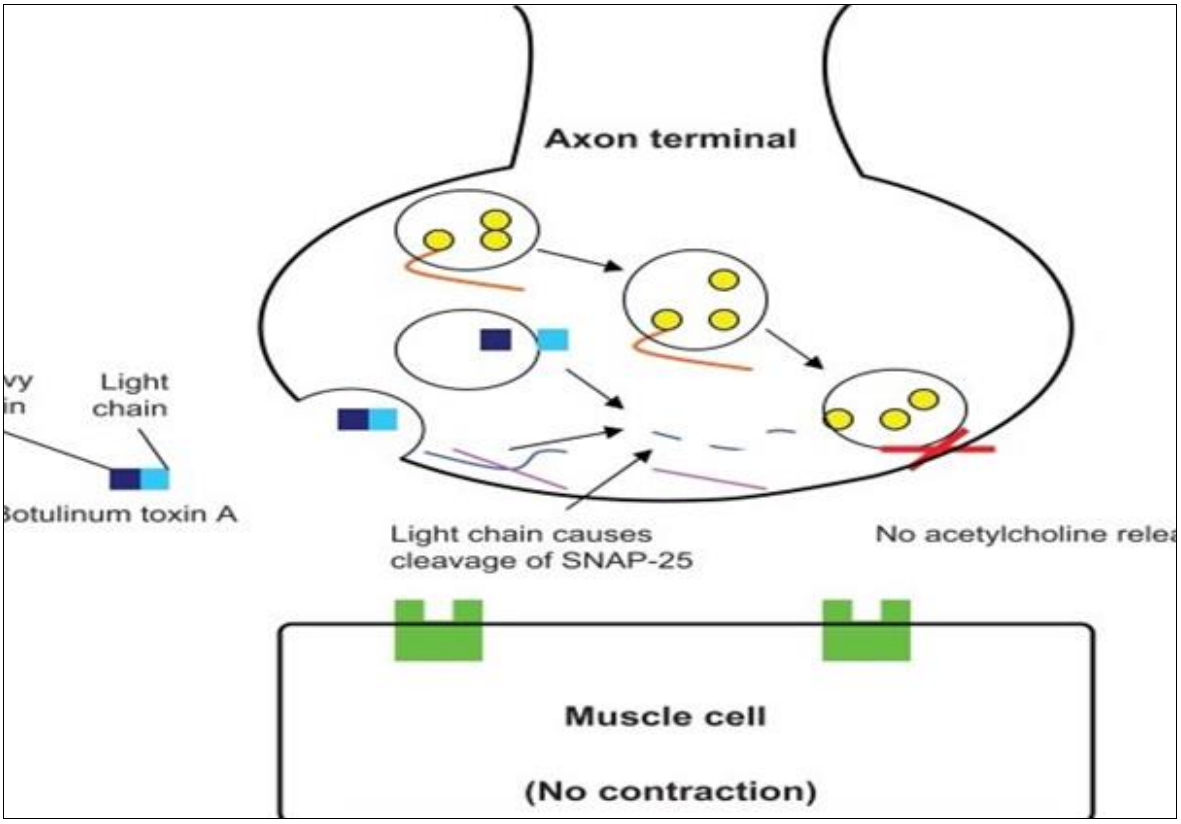

Fig 1

- BT is most commonly known for its cosmetic applications. Out of all the preparations available in the market, Botox® has received maximum approvals worldwide and is the most commonly used.

Indications

Botulinum toxin type a uses in dentistry

- Gummy smile
- Massetric hypertrophy
- Bruxism
- Pathologic clenching
- Mandibular spasm
- Temporomandibular joint disorder
- Trigeminal neuralgia
- Sialorrhea

Contraindications

- Psychologically unstable, unrealistic expectation.
- Neuromuscular disorder (myasthenia gravis)
- Allergic to components of BTX-A, BTX-B.
- Pregnancy and lactating females.

Side effects of Botox

1. Temporary side effects like like fever, palpitations, tingling sensations and nausea which usually subside within 1-2 days.
2. Temporary partial weakness of the injected muscle.
3. Muscle soreness for few days after injection.
4. If Botox is injected for a longtime, it may cause atrophy of the muscle injected which can be reversible if the Botox therapy is discontinued.
5. Edema around the injection site

6. Mild, localized and transient headache.
7. Ecchymosis lasting 3 – 10 days.
8. Numbness and parasthesia.
9. Mild malaise and myalgias.
10. Occasional vomiting.

Derma fillers in dental practice

Derma fillers are substances that are injected beneath the skin to enhance volume, minimising the appearance of perioral wrinkles and areas of low volume. The ideal dermal filler would be affordable, risk-free, easy to administer, hypoallergenic, and long-lasting.

As more individuals learn about cosmetic procedures, their desire to seem younger grows daily. In response, the cosmetic industry has given dentists and cosmetic surgeons a wide range of alternatives to fulfil the needs of this sort of patient.

Types of derma fillers

Dermal filler can be categorized as [6].

a. Biodegradable (moderate and long duration)
b. Non-biodegradable fillers.

Moderate duration biodegradable fillers

Examples are collagen and the hyaluronic acid (HA) fillers, they are reabsorbed by the body quite quickly, so their cosmetic benefits are fairly short-lived.

Non-biodegradable fillers

As a result of the foreign body reaction they cause, collagen is deposited by fibroblasts everywhere around the non-absorbable microspheres.

Examples are polymethylmethacrylate (PMMA; Artecoll, the polyacrylamide hydrogel aquamid, and silikon 1000, a medical-grade pure form of silicone.

Dermal fillers dental therapeutic uses

- Used to establishing aesthetic dental lip lines and smile lines as an alternative to crown lengthening, gingivectomy, and veneers.
- Treatment of angular cheilitis.
- Elimination of “black triangles” that form between teeth after periodontal and implant surgical treatment.

Fig 2

- Restoring lip volume is necessary for good phonetics.
- Restoring lip and peri-oral volume around the mouth is necessary to keep removable prosthetics in place.
- Gummy smile treatment.

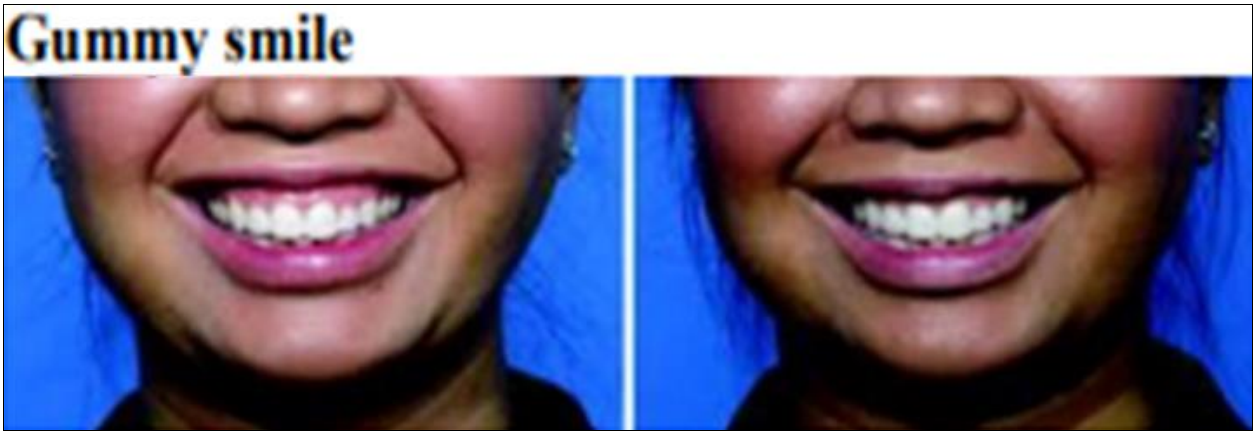

Fig 3

Cosmetic indication of dermal fillers

Used for volume replacement and enhancement procedures, including.

a. Cheek and chin augmentation
b. Tear trough correction, nose reshaping
c. Midfacial volumization
d. Lip enhancement
e. Hand rejuvenation,
f. Correction of facial asymmetry.

- Filling of rhytides (e.g., glabellar frown lines, forehead furrows, crow’s feet, fi ne perioral rhytides, shallow scars) and folds.
- Acne scars and wrinkles.
- Correction of soft tissue loss due to disease or age.

Fig 4

Contraindications

Absolute

1. Hypersensitivity to products.
2. Unrealistic expectations.

Relative

1. Keloid tendency.
2. Patients with autoimmune disease.

Conclusion

In recent years, derma fillers and botox have entered the dental practise for both cosmetic and therapeutic uses in the oral and maxillofacial regions. They are here to stay, and as additional intraoral applications are made possible, they are swiftly emerging as a standard component of routine dental care, with implications for restorative, aesthetic, periodontal, orthodontic, and prosthodontic procedures. They provide people with the most significant, responsible, meddling, cosmetic, and therapeutic results possible for many typical clinical settings.

Great Botox" application requires steady hands, the eye of an artist, and the innate ability to get it right. Although the drug is considered generally safe, there are a number of uncommon, relatively mild adverse reactions.

"You can teach an Old Dog New Tricks": Training is absolutely necessary for dentists to administer injections, but learning curve is very short, because dentists can already achieve profound anesthesia in the orofacial region, thus making patient more comfortable and at ease

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