

## Original Research

### Botox and fillers

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#### ABSTRACT:

Botox and dermal fillers are cosmetic treatments given through injections. They are minimally invasive, meaning they do not involve surgery. Botox contains purified bacteria that freeze the muscles. This helps minimize the appearance of lines and wrinkles caused by facial expressions. Dermal fillers contain ingredients that add fullness to areas that have thinned due to aging. This thinning is common in the cheeks, lips, and around the mouth.

**Key words-** Botox, Facial wrinkle, Dermal fillers

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#### WHAT IS BOTOX?

Botox works by blocking the release of acetylcholine, resulting in paralysis of the local muscles, which usually occurs 24 hrs to two weeks following Botox injection. This effect will last three to six months. The optimal dose of cosmetic Botox is 20 units. Botox is relatively safe and does not result in any adverse side effects. However, in certain circumstances, the effect of Botox will gradually resolve, resulting in reduced muscle paralysis over time.<sup>1</sup>

#### HOW DOES BOTOX WORK?

All the serotypes interfere with neural transmission by blocking the release of acetylcholine, which is the principal neurotransmitter at the neuromuscular junction. Intramuscular administration of botulinum toxin acts at the neuromuscular junction to cause muscle paralysis by inhibiting the release of acetylcholine from presynaptic motor neurons.<sup>2</sup> Botulinum toxins act at four different sites in the body: The neuromuscular junction, autonomic ganglia, postganglionic parasympathetic nerve endings and postganglionic sympathetic nerve endings that release acetylcholine.<sup>1</sup> The heavy (H) chain of the toxin binds selectively and irreversibly to high affinity receptors at the presynaptic surface of cholinergic neurones, and the toxin-receptor complex is taken up into the cell by endocytosis. The

disulphide bond between the two chains is cleaved and the toxin escapes into the cytoplasm. The light (L) chain interact with different proteins (synaptosomal associated protein (SNAP) 25, vesicle associated membrane protein and syntaxin) in the nerve terminals to prevent fusion of acetylcholine vesicles with the cell membrane.<sup>1,3</sup> The peak of the paralytic effect occurs four to seven days after injection. Doses of all commercially available botulinum toxins are expressed in terms of units of biologic activity. One unit of botulinum toxin corresponds to the calculated median intraperitoneal lethal dose (LD<sub>50</sub>) in female Swiss-Webster mice.<sup>4</sup> The affected nerve terminals do not degenerate, but the blockage of neurotransmitter release is irreversible. Function can be recovered by the sprouting of nerve terminals and formation of new synaptic contacts; this usually takes two to three months.<sup>5</sup>

Botulinum toxin induces weakness of striated muscles by inhibiting transmission of alpha motor neurones at the neuromuscular junction. This has led to its use in conditions with muscular overactivity, such as dystonia. Transmission is also inhibited at gamma neurones in muscle spindles, which may alter reflex overactivity.<sup>5</sup> The toxin also inhibits release of acetylcholine in all parasympathetic and cholinergic postganglionic sympathetic neurones. This has generated interest in its use as a treatment for

overactive smooth muscles (for example, in achalasia) or abnormal activity of glands (for example, hyperhidrosis)] It requires 2-3 days to take effect, reflecting the time necessary to disrupt the synaptosomal process. Rarely, some individuals may require as many as five days for the full effect to be observed. Peaking at about 10 days, the effect of botulinum toxin lasts nearly 8-12 weeks.<sup>1,4</sup>

### RISKS<sup>5</sup>

Botox injections are relatively safe when performed by an experienced doctor. Possible side effects and complications include:

- Pain, swelling or bruising at the injection site
- Headache or flu-like symptoms
- Droopy eyelid or cockeyed eyebrows
- Crooked smile or drooling
- Eye dryness or excessive tearing

### CONTRAINDICATION<sup>6</sup>

- Pregnancy or active nursing
- Pre-existing neuromuscular condition such as myasthenia gravis or Eaton Lambert Syndrome

Syndromes

- Intake of aminoglycoside antibiotics
- Severe coagulopathies
- Secondary hyperhidrosis due to underlying disease

### CONCLUSION

Botox is good and safe medicine to reduce the appearance of facial wrinkles.

### WHAT ARE DERMAL FILLERS?

Dermal fillers are substances used in soft tissue augmentation to enhance or replace volume that is lost in any part of the skin or subcutaneous fat. Fillers form an effective tool in rejuvenation, either as a stand-alone treatment or in combination with other procedures such as Laser resurfacing or botulinum toxin.<sup>6</sup> The use of dermal fillers in soft tissue augmentation is undergoing a renaissance period with many new filler materials appearing in the market. The practice of soft tissue augmentation was started by Neuber in 1893, who took fat from the arms and transplanted it into facial defects. In 1899, paraffin was used and was later given up due to foreign body granulomas or paraffinomas.<sup>7</sup>

In the 1940s and 1950s, silicone was used extensively until the commissioner of the US-Food and Drug Administration (US-FDA) declared the use of injectable silicone to be illegal. The field of soft tissue augmentation underwent a revolutionary change in the early 1970s when researchers at Stanford University worked on the use of animal and human collagen as implant materials. The search for an ideal, permanent dermal filler is still ongoing and no single, currently available filler meets all expectations of the physician.

### TYPES<sup>8</sup>

1. Hyaluronic acid
2. Calcium hydroxylapatite
3. Poly methacrylate
4. Poly-L-Lactic acid
5. Human fat

### HOW DO DERMAL FILLERS WORK?

Dermal fillers work by boosting the skin's supply of hyaluronic acid, dermal fillers revitalise and add volume to the skin, instantly diminishing the appearance of lines and wrinkles, and giving a natural softer look. Dermal fillers are a soft injectable gel consisting of stabilized, non-animal hyaluronic acid.<sup>9</sup> The gel is tissue-friendly and closely resembles the hyaluronic acid that exists naturally in the body. It is long-lasting but not permanent.

Dermal filler injections provide an easy way to reduce the appearance of wrinkles, smooth the skin and give a more youthful appearance. The result of a single treatment can be seen instantly and can last for around 6 to 9 months.<sup>10</sup> Dermal filler injections can give a natural looking result that does not affect facial expression. As your face changes over time, dermal fillers allow you to control your looks subtly as you age. Dermal fillers can be used to smooth away facial lines and wrinkles, create fuller lips and shape facial contours, such as cheeks and chin, and revitalise the skin.

### COMPLICATIONS

Filler injections in the forehead and glabellar region are at particularly high risk of intravascular occlusion due to the upper face vascular complex and should be carefully placed subdermally or intradermally.<sup>10,11</sup> Injections suspected of being intraarterial in this region and others can lead to occlusion of the central retinal artery and blindness, and require urgent evaluation from an experienced oculoplastic surgeon.<sup>12</sup> If not treated, vision changes can be permanent in 90 min or less.<sup>13,14</sup> Injections to the tear trough should be performed deep on the periosteum to avoid the vasculature, visible surface irregularities, or the Tyndall effect (bluish-gray discoloration) due to the thinness of the lower lid skin.<sup>12,13</sup> Persistent edema, ecchymosis, and asymmetry are also common in this region, especially in patients who have a history of allergies or hypersensitivity, or poor lower lid tone.<sup>12,13</sup> Finally, improperly placed, high volume nasal injections can result in catastrophic consequences such as nasal tip necrosis (especially in those with a history of open rhinoplasty), or blindness from intravascular filler placement<sup>16</sup>

Immediate and severe pain and blanching in the course of a vascular trajectory is the signature sign of intra-arterial injection with resultant tissue loss in the distal vasculature occurring 24-48 hours postinjection. Subsequent cutaneous necrosis, also known as Nicolau syndrome can be a devastating

complication. Vision loss, blindness, and stroke represent the most devastating intravascular complications of filler injection. Standard of care treatments for vascular compromise include the repeated bathing of the injection trajectory with hyaluronidase, nitroglycerin paste, topical corticosteroids, and warm compresses in addition to the administration of aspirin and potentially acetazolamide.<sup>15</sup> Hyaluronidase can be injected hourly as required in doses of 500 up to 1500 iu depending on the extent of tissue involvement and acuity of the complication.

## CONCLUSION

The past decade has seen the arrival of a host of new soft tissue fillers for facial rejuvenation, which not only remove wrinkles but also have the ability to restore facial volume to create a balanced, more natural rejuvenated look. To achieve cosmetically pleasing results, it is essential that those practicing facial rejuvenation have a thorough understanding of the individual characteristics of available fillers, their indications, contraindications, benefits and drawbacks, and ways to prevent and avoid potential complications.

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