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Botox for Treat in Clinical Studies

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Abstract: In order to explore the effectiveness and safety of botox in the treatment of gingival smile, this paper adopts statistical analysis method, selected during March 2023 to March 2024,100 patients as a research object, botox injection treatment, observe the degree of patients before and after treatment, facial appearance improvement, adverse reactions, etc. After statistical analysis, it was found that most patients were significantly reduced, facial beauty was significantly improved, and the incidence of adverse reactions was low. Therefore, Botox is a safe and effective method.

The application of Botox in the treatment of gingival laughter is mainly benefited from its excellent muscle relaxation ability, a property derived from its unique nerve inhibitory mechanism. Gingival smile, as a phenomenon of excessive exposure of gums when smiling, not only affects facial beauty, but also may have a negative impact on the social confidence of patients. Therefore, it is particularly important to seek effective treatment. As a kind of oral problem affecting facial beauty, gingival smile often brings psychological pressure to patients. In social situations, patients may avoid laughing for fear of gingival laughter, thus affecting their social interaction and confidence. Studies have shown that facial aesthetics is closely related to personal mental health, and the presence of gingival laughter may lead to psychological problems such as anxiety and depression. Botox, as a neurotoxin, can block the process of releasing acetylcholine from nerve terminals by precise injection into the target area, leading to temporary muscle relaxation and paralysis[1]. This mechanism is skillfully applied to treat gingival laughter. By injecting botulinum toxin type A into the lift muscle of the upper lip, the tension of the muscle can be accurately weakened, thus reducing the exposure of the gums when smiling and significantly improving the gingival laughing problem[2]. This method is not only simple to operate, but also remarkable, providing a new treatment option for many patients troubled by gingival laughter. In recent years, Botox is increasingly used in the field of plastic surgery, and this study aimed to evaluate the clinical effect of Botox in the treatment of gingival laughter.

1. Materials and Methods

1.1 Study subjects

1.1.1 Inclusion criteria

1) Between 18 and 60 years old.
2) There is obvious gingival smile, and the gingival exposure when smiling is 3mm, which is

determined by the joint evaluation of a professional stomatology doctor and a plastic surgeon.

3) Good health, no systemic diseases, such as cardiovascular disease, diabetes mellitus, immune system disease, etc.

4) There is no history of oral and maxillofacial surgery, and no oral related orthodontic treatment in the last 6 months.

5) The patient needs to cooperate with the treatment process and the subsequent follow-up observation, voluntarily receive Botox treatment, and sign the informed consent form.

1.1.2. Exclusion criteria

1) Those who are allergic to Botox and other ingredients should be excluded through detailed inquiry of allergy history and skin allergy tests.

2) Patients with neuromuscular diseases such as myasthenia gravis and progressive muscular dystrophy are examined through neurological examination, muscle function tests and other methods.

3) Pregnant or lactating women should be confirmed according to the patients self-report and related examinations.

4) Those who had undergone other facial plastic surgery recently (within 3 months) asked the patient about their surgical history in detail.

A total of 100 gingival patients who met the above criteria, including 28 men and 72 females aged between 20 and 55 years with a mean age of (35.5 ± 8.5).

1.2 Treatment methods

1) Drugs: using a certain brand of Botox, each bottle is 100 units.

2) Injection site: Doctors according to the specific situation of the patient, we usually choose the upper lip nasal muscle, upper lip muscle and zygomatic muscle and other muscles. The distribution of the specific injection points are as follows: the lateral edge of the upper lip and the middle 1 point respectively.

3) Injection dose: Generally, the injection dose at each point is 2 to 3 units, which is adjusted individually according to the muscle strength and gingival smile degree of the patient, and the total dose should not exceed 20 units. For example, patients with mild gingival laughter can inject 2 units per point, patients with moderate gingival laughter can inject 2.5 units per point, and patients with severe gingival laughter can inject 3 units per point.

4) Injection method: After routine disinfection of the patient injection site, the physician uses a 1ml syringe and a 30G needle. The injection should be slow injection, pushing the injection time of about 1 to 2 minutes / point, to avoid drug leakage. The treatment time will be arranged on the 1st to 5th of each month, including the first batch of patients from March 1st to March 5th, 2023.

1.3 Observing indicators

1) Gingival laughing degree: the degree of gingival laughing was evaluated using [gingival laughing assessment scale] before treatment, 1 week (March 8 to March 12, 2023), 1 month (1 April to April 5, 2023), 3 months (June 1, 2023 to June 5, 2023) and 6 months (September 1 to September 5, 2023).

2) Facial aesthetic improvement: the facial aesthetic improvement was evaluated at 1 month (April 1 to April 5, 2023), 3 months (June 1 to June 5, 2023) and 6 months (September 1, 2023 to September 5, 2023).

3) Adverse reactions: The doctor observed the local and systemic adverse reactions, such as pain,

swelling, congestion, headache, and fever, during the treatment (0 to 24 hours, after injection).

1.4 Statistical methods

Data analysis was performed using the SPSS 22.0 statistical software. Measurement data are expressed as mean ± standard deviation (x ± s), paired t-test for pre-post treatment comparisons; count data are expressed as rate (%), and chi-square test is used for group comparisons. P <0.05 was considered to be statistically significant.

2. Results

2.1 Comparison of gingival laughter before and after treatment

Compared with before and after treatment, the gingival laughing extent of the patients at all time points after treatment was significantly reduced (P <0.05), as shown in Table 1.

Table 1: Comparison of gingival laughter before and after treatment (x±s, mm)

Evaluation time	Gingival smile degree (mm)
pretherapy	5.5 ±1.5
one week after treatment (March 8 to March 12 2023)	3.5 ±1.0
one month after treatment (April 1 to April 5 2023)	3.0 ±0.8
three months after treatment (June 1 to June 5 2023)	3.2 ±0.9
six months after treatment (September 1 to September 5 2023)	3.5 ±1.0

2.2 Improvement of facial appearance

Patient self-evaluation and physician evaluation showed that at 1 month, 3 months and 6 months after treatment, 75%, 80% and 70%, respectively, and patients were satisfied with the treatment effect, as shown in Table 2.

Table 2: The facial aesthetics significantly improved the proportion of patients (%)

Time of therapy	Improve the proportion
one month after treatment (April 1 to April 5 2023)	75
three months after treatment (June 1 to June 5 2023)	80
six months after treatment (September 1 to September 5 2023)	70

2.3 Adverse reactions

Table 3: Adverse reactions

Adverse reaction type	The number of cases
local pain	10
local swelling	8
extravasated blood	5

During and after treatment, 10 patients experienced local pain, 8 patients experienced local swelling, and 5 patients developed congestion, and these adverse reactions resolved spontaneously

within 1 to 2 weeks. There were no systemic adverse reactions, such as headache and fever, as shown in Table 3.

3. Discussion

3.1 Mechanism of Botox treatment on gingival laughter

The gingival smile is mainly due to the excessive contraction of the lift muscle on the upper lip. In response to this problem, Botox has shown its unique curative effect. Botox effectively blocks the signal transmission between nerves and muscles by inhibiting the release of acetylcholine at the neuromuscle joint, thus enabling the muscle to reach a relaxed state. This mechanism is particularly suitable for relieving the excessive contraction of the upper lip lift muscle, and then reducing the symptoms of gingival laughter. Specifically, the application of Botox in the treatment of gingival laughter is based on its ability to accurately act on the target muscle group to achieve local muscle paralysis. This mode of action is not only targeted, but also significant, which can improve the facial expression of patients to a certain extent and make it more natural and harmonious. The effect of Botox on gingival laughter is not permanent and usually lasts from 4 to 6 months. Therefore, patients may need to receive regular injections according to their own conditions to maintain the treatment effects. At the same time, when choosing Botox treatment, it is necessary to go to a regular medical institution, with professional doctors operating, to ensure the safety and effectiveness of the treatment. As an effective treatment, Botox showed its unique advantage in alleviating the symptoms of gingival laughter[3].

3.2 Detailed description of treatment methods, preoperative preparation and postoperative care

There are many types of Botox products on the market, but not all products are suitable for gingival laughter treatment. Choosing the right Botox product is essential for therapeutic efficacy. Usually, Botox A is widely used because of its significant effect and few side effects. Before taking the botox injection, the doctor needs to conduct a comprehensive assessment of the patient, including the tension of the facial muscles, the degree of gingival exposure, etc. In addition, patients should be informed of the treatment process, possible effects and potential risks and sign informed consent. After the injection, patients need to follow a series of nursing instructions to ensure treatment effectiveness and reduce side effects. This includes avoiding touching the injection area within a few hours after the injection, avoiding strenuous exercise, and using an ice or hot compress under the guidance of a doctor.

3.3 Treatment effect

Although the effect of botox injection on gingival laughter is remarkable, the effect is not permanent. Usually, the treatment effect can be maintained for 4 to 6 months, after which the patient may need to receive another injection to maintain the effect. Treatment effects may vary by individual differences. Some patients may respond better to botox, while others may require more injections or more frequent maintenance therapy. This study clearly revealed the remarkable effect of Botox in the treatment of gingival laughter. After treatment, the patients gingival smile symptoms were significantly relieved, and the overall beauty of the face was significantly improved. This finding matches the results reported by numerous studies at home and abroad, further validating the effectiveness of Botox in this therapeutic field [4].

3.4 Adverse reactions

In this study, the patient mainly experienced local pain, adverse reactions[5-6], swelling and congestion. Fortunately, these adverse effects were assessed as mild and resolved spontaneously in a short period without long-term or significant effects on the patient. Furthermore, no serious systemic adverse effects were not observed in this study, which further emphasizes the relative safety of Botox in the treatment of gingival laughter.

3.5 Treatment Precautions

Injection dose and site selection. Individualized adjustment: according to the specific condition of the patient, such as the degree of gingival exposure, facial muscle structure and site on, etc. In general, patients with gingival exposure of 2 to 4 units of botulinum toxin can be injected on the 1cm lateral side of the alar nose, while patients with gingival exposure of more than 4mm are injected at the confluence of the upper aspirator, levator and zygomatic muscles. Avoid excessive: too much injection may lead to worse adverse reactions, such as local muscle stiffness, unnatural expression, etc. Therefore, doctors should strictly control the injection dose to ensure its safety and effectiveness.

Injection technique. Dilution and preparation: Botulinum toxin should be diluted to 2.5 units per 0.1 mL and injected with an appropriate syringe (e. g. 1 mL syringe) and needle (e. g. 30G needle). Slow injection: the drug injection should be slowly injected to avoid drug leakage into the non-target area, affect the treatment effect and increase the risk of adverse reactions. Injection depth: The injection depth is generally at the thickest place of the nasal groove muscle, vertical to the skin into the needle, and the depth is controlled at 3 to 5mm. Doctors should ensure that the drug can act accurately on the target muscle layer and avoid injecting too shallow or too deep[7-8].

Nursing care after treatment. First, we need to avoid massage and hot compress: after treatment, massage and hot compress on the injection site should be avoided, so as to avoid the spread of drugs to the non-target area, affecting the treatment effect and increasing the risk of adverse reactions. Second, pay attention to living habits: do not lie down within 4 hours to 6 hours after injection to avoid Botox dispersion; do not wash face, makeup and touch the injection site within 6 hours; ban spicy food, seafood, alcohol and tobacco within one week; prohibit facial massage, hot compress and rubbing within one month. Third, observation and return visit: after treatment, the reaction of the injection site should be closely observed, such as slight swelling, congestion is a normal phenomenon, generally can subside after a few hours. If the symptoms continue to worsen or other symptoms occur, they should seek medical advice immediately. Furthermore, patients should return to the hospital after two weeks to evaluate treatment efficacy[9-10].

4. Conclusion

Botox is a safe and efficient method. It can effectively inhibit the contraction of the muscle on the upper lip, thus significantly reducing the degree of gingival smile and optimizing the aesthetic feeling of facial contour. During the treatment, it is important to accurately select the injection dosage and site, and master the injection skills. At the same time, the nursing work after treatment cannot be ignored, in order to ensure the double guarantee of efficacy and safety.

In conclusion, Botox especially botulinum toxin A has shown good clinical results and high patient satisfaction in the treatment of gingival laughter. Despite some risk of side effects, its minimally invasive nature and reversibility make it a popular cosmetic treatment option. Future studies should further explore optimizing the injection technique and how to reduce the occurrence of side effects and thus improve the safety and efficacy of treatment.

References

[1] Zheng Wei, Li Yu. New progress in multidisciplinary treatment of gingival smile [J]. International Journal of Oral Medicine, 2017, 44 (5): 509-513.
[2] Zhang Dong, Yang Changsheng, Song Guodong, et al. Cause and treatment progress of gingival smile [J]. Chinese Journal of Plastic Surgery, 2022, 38 (8): 940-945.
[3] Bertossi D, Cavallini M, Cirillo P, et al. Italian consensus report on the aesthetic use of onabotulinum toxin A. J Cosmet Dermatol. 2018; 17:719–730.
[4] Xu Yali. Current status and prospect of botulinum toxin A in otolaryngology [J]. Journal of Clinical Otolaryngology, Head and Neck Surgery, 2020, 34 (1): 88-91. DOI:10.13201/j.issn.1001-1781.2020.01.022.
[5] Expert Group of Bottoxin Treatment Application, Parkinsons Disease and Movement Disorders, Neurology Branch of Chinese Medical Association, Chinese Expert Consensus on Treatment Application of Bottotoxin [J]. Chinese Journal of Neurology, 2018, 51 (10): 779-786.
[6] Luis H. Ishida Luiz C. Ishida Jorge Ishida Julio Grynglas Nivaldo Alonso Marcus C. Ferreira. Lift the upper lip myotomy and upper lip reduction: a combined method to correct the gingival smile [J]. Chinese Journal of Cosmetic and Plastic Surgery, 2014, 25 (6): I0009-I0011.
[7] Injection cosmetology Group of Dermatology Branch of Chinese Medical Doctor Association, Skin Beauty and Surgery Group of Dermatology Branch of Guangdong Medical Doctor Association, Yu Bo. Expert consensus on the application of botulinum toxin injection in skin cosmetology (2023 version) [J]. Cosmetic medicine in China, 2023, 32 (11): 1-9.
[8] Fatani B (January 21, 2023) An Approach for Gummy Smile Treatment Using Botulinum Toxin A: A Narrative Review of the Literature. Cureus 15(1): e34032. doi:10.7759/cureus.34032
[9] Sun Ying, Sun Yuping, Yu Bo, et al. Clinical study of facial expression abnormalities caused by botulinum toxin A injection [J]. Cosmetic medicine in China, 2012, 21 (12): 74-75.
[10] Chen Xiao, He Ping. Analysis of the efficacy of botulinum toxin A combined with silicone dressing in facial surgery applications [J]. Cosmetic Medicine in China, 2017, 26 (12): 105-108.