RESEARCH LETTER

Intrafollicular Orifice Injection Technique for Botulinum Toxin Type A

Botulinum toxin type A (Botox; Allergan Inc, Irvine, California) injection for facial enhancement is the most common cosmetic procedure performed in the United States.[1-3] Patient comfort and pain control is important for patient satisfaction and for patient retention after the cosmetic procedure. The use of preservative-containing isotonic sodium chloride solution (normal saline), topical anesthesia, and cryoanalgesia prior to injection of botulinum toxin type A or B decreases patient discomfort, as does the use of 32-gauge rather than 30-gauge needles.[4-6] Since intrafollicular orifice injection (IFOI) decreases the pain of local anesthesia,[7] we extend the technique to the injection of botulinum toxin into the glabellar region. In the present study, we compared the IFOI technique with nonfollicular traditional injection (TI) with regard to patient pain perception.

Video available online at www.archdermatol.com

Methods. This prospective, randomized study was limited to female patients with no history of receiving Botox. Exclusion criteria were pregnancy, attempting pregnancy, and/or breastfeeding; known hypersensitivity to ingredients; peripheral motor neuropathic diseases or neuromuscular junctional disorders; and/or taking aminoglycosides (eg, gentamicin), anticholinesterase (eg, neostigmine), or lincosamides (eg, clindamycin). Informed consent was obtained, and the study was performed in accordance with institutional review board approval at Henry Ford Health System.

The Botox from the manufacturer was diluted with 2.5 mL of bacteriostatic, preservative-containing normal saline, 0.9%, resulting in 4 U of Botox per 0.1 mL of solution. One of us (D.O.) injected a total of 12 U of Botox into each patient's glabellar complex. As illustrated in the video (www.archdermatol.com), we pinched and held the skin at the injection site before using a 31-gauge BD Ultra-Fine II short needle (BD Consumer Healthcare, Franklin Lakes, New Jersey) with a 0.3-mL insulin syringe to administer the IFOI or TI treatment.

Patients were randomly assigned to start with either IFOI or TI and received a total of 6 injections: 2 into the procerus and 2 each into the right and left corrugator supercilii. Odd-numbered patients started with IFOI, and even-numbered patients with TI. If the procerus initially was treated with IFOI, then the right corrugator would be treated by the TI technique first, and the left corrugator with IFOI. After each set of injections into a location, the patient rated her pain from 1 to 10 and chose the number of the injection that was more painful (1 or 2).

For each site (procerus and bilateral corrugator supercilii), we tested the IFOI to TI pain score ratio against a ratio of 1:1 using the χ^2 test of specified proportions. The pain scores from all of the locations simultaneously were evaluated by repeated measures analysis of variance with factors for treatment and location. In the repeated measures analysis, pain scores were logarithm transformed to better conform to the assumption of distributional normality. All *P* values less than .05 were considered statistically significant.

Results. When directly comparing the 2 injection techniques at each of the 3 locations, we found that statistical significance was achieved in the right corrugator ($P = .046$) (**Table 1**). The repeated measures analysis of variance with factors for treatment type and location to evaluate the pain scores from all locations simultaneously detected statistically significant differences among the 3 locations ($P = .02$) and the 2 treatment techniques ($P < .001$). The interaction *P* value indicated that the pain score difference between the 2 treatments was similar within each location. The location *P* value indicated that there was a statistically significant overall pain score difference among the 3 locations (highest pain scores in the right corrugator, followed by the left corrugator, and lowest in the procerus) (**Table 2**). The treatment *P* value indicated that there was a statistically significant overall pain score difference between the 2 treatment techniques, with the TI technique pain scores being higher than the IFOI pain scores.

Table 1. Patient Assessment of Pain With Botulinum Toxin Type A Injection Comparing Intrafollicular Orifice Injection (IFOI) With Traditional Injection (TI) Technique[a]

Location of Injection	IFOI More Painful	TI More Painful	Pain of IFOI and TI Equal	*P* Value[b]
Procerus	5	7	8	.56
Right corrugator	4	12	4	.046[c]
Left corrugator	4	11	5	.07

[a] Unless otherwise indicated, data are reported as number of patients. Botulinum toxin type A is manufactured as Botox by Allergan Inc, Irvine, California.
[b] χ^2 Test.
[c] Significant difference.

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Table 2. Mean (SD) Pain Scores With Botulinum Toxin Type A Injection Comparing Intrafollicular Orifice Injection (IFOI) and Traditional Injection (TI) Techniques[a]

Location of Injection	IFOI	TI	*P* Value
Procerus	1.38 (1.40)	1.76 (1.18)	.18
Right corrugator	2.07 (1.81)	2.64 (1.94)	.02
Left corrugator	1.76 (1.73)	2.38 (1.80)	.09

[a] The scale for all pain scores was 1 to 10. Botulinum toxin type A is manufactured as Botox by Allergan Inc, Irvine, California.

Comment. Our study demonstrates a decrease in pain with the IFOI injection technique in a location with prominent follicular openings. We hypothesize that patients with large, prominent pores will have the most pain reduction with the IFOI technique; however, we are unable to support this hypothesis because we did not stratify our patients based on pore size. It is possible that the decrease in pain when the follicular orifice is cannulated is due to decreased depth of dermal penetration. We also demonstrated that injection of the procerus, regardless of technique, is significantly less painful than injection into the corrugators.

A limitation to our study is that a single unblinded physician administered the injections. Nonverbal cues may have been unintentionally communicated by the physician. It is also possible that the physician grasped the skin more firmly during IFOI injections, which may have acted as a greater distracter to the patient and decreased pain sensation. Repetitive use of the same needle may result in some dulling of the tip. Finally, small variations in injection aliquot size could result in variation in tissue distortion.

The IFOI technique is easily implemented because it requires no additional time or effort by the patient or office staff. It may also help decrease patient apprehension, increase overall patient satisfaction, and improve patient retention.

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Additional Information: A video supplement is available at www.archdermatol.com.
Additional Contributions: Henry W. Lim, MD, supported the work throughout this project; Joseph Madej produced the video presentation; and Jennifer Janiga, MD, participated as the video subject.

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COMMENTS AND OPINIONS

Seventy Seconds Inadequate for a Complete Skin Examination

We read with skepticism "Time Required for a Complete Skin Examination With and Without Dermoscopy" by Zalaudek et al[1] and believe that the time required for a complete skin examination was grossly understated. A complete skin examination includes the evaluation of the scalp, genitalia, mucous membranes, and conjunctiva. In this study, the scalp and genitalia were not examined unless directed by the patient. We suspect that these areas were examined infrequently, since it is unusual for a woman to point out a pigmented vulvar lesion, and macular lesions on the scalp are usually invisible to the patient. The scalp examination is usually the most time-consuming part of a complete skin examination. Moreover, there was no mention whether mucous membranes or conjunctiva were included in the examination described in the study. Perhaps the title of the article would have more accurate as "Time Required for a *Partial* Skin Examination. . . ."

The mean age of the patients examined (40 and 39 years in the respective arms) was quite young. Younger patients generally have fewer skin lesions, both benign and malignant, and are also able to cooperate much better with the examination procedures than older patients. It defies logic that those patients reported by Zalaudek et al[1] found to have more lesions required less time to examine. The well-trained dermatologist knows that he cannot simply rely on the ugly duckling sign to recognize malignant neoplasms. In patients with multiple

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