Discussion

Botox for the Treatment of Dynamic and Hyperkinetic Facial Lines and Furrows: Adjunctive Use in Facial Aesthetic Surgery

Discussion by Rod J. Rohrich, M.D., and Jeffrey E. Janis, M.D.

Although this article was published in 1999, its discussion of the cosmetic use of botulinum toxin remains accurate and pertinent in 2003. Dr. Fagien, a pioneer in the field of chemodenervation for the effacement of facial rhytides, is thorough in his explanation of botulinum toxin type A, or Botox (Allergan, Inc., Irvine, Calif.), and its applications, from its mechanism of action to its use in various regions of the face to potential complications and pitfalls.

Since the original publication of this article, the U.S. Food and Drug Administration has approved the use of botulinum toxin for the treatment of glabellar rhytides, as it has been proven both safe and effective.[1] It is only a matter of time before its use is approved in other regions of the face and neck; however, for now, its use in areas other than the glabellar region remains "off-label."[2]

Our techniques for performing Botox injections are similar to those of Dr. Fagien. We take the same precautions to ensure proper storage and handling, which (as emphasized in the article) are just as important as proper injection technique. Careful reconstitution using nonpreserved saline and avoidance of turbulence and foaming are paramount. Our dilution (4 cc per vial to yield a concentration of 2.5 U/0.1 cc), which is identical to Fagien's, provides for low volumes and high concentrations, therefore limiting spread of the toxin and subsequent adverse effects. We have also found a decrease in effectiveness and potency beyond 3 to 4 days. We routinely attempt to use the entire vial within 48 hours of reconstitution.

Several key points mentioned within the article deserve added emphasis. As Dr. Fagien has pointed out, a thorough understanding of the underlying facial mimetic musculature is fundamental to the treatment of the resultant rhytides. The thickness of the muscles and their proximity to adjacent structures (including other muscles, vessels, and nerves) play major roles in the technique of injection. Specifically, certain areas require deeper injection to have maximal effect (i.e., frontalis and corrugator muscles), while others require more superficial injections (e.g., the orbicularis oculi). Electromyographic studies have demonstrated that the toxin can spread by diffusion to an area up to 3 cm or more from the injection site,[3,4] so we recommend accurate intramuscular injection in most cases. Knowledge of this anatomy not only benefits the patients by giving them the most effective, long-lasting aesthetic result but also helps avoid complications, such as hematoma and ecchymosis (especially in the lateral canthal area, where the venous plexus is more dense). In addition, we use ice to help diminish swelling and ecchymosis at the site of injection (especially around the perioral area), and we are careful to avoid massage of the injection site, as this can cause unwanted migration and diffusion of the toxin.

Another key point to emphasize is the use of Botox in cosmetic shaping. Fagien's use of Botox in the brow region has been expanded in recent years, and in some cases, it has been used as a "chemical" brow lift.[5] Although the ability to shape the brow contour is neither as directed nor as powerful as traditional surgical approaches, it remains a very effective means

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of delivering subtle changes. This should not be overlooked in patients desiring minor modifications to the aesthetic contour or in patients who have incurred unilateral complications from other procedures (i.e., frontal branch injuries in rhytidectomies). Botox is an invaluable tool in the latter circumstance, when the anxious patient (and surgeon) desires more facial symmetry while the injury is observed for potential resolution.

One area not mentioned in this article that has evolved since its publication is the use of Botox in the treatment of platysmal bands of the neck. The same principles apply, namely, (1) a thorough understanding of the underlying anatomy and (2) proper diagnosis of rhytides secondary to hyperkinetic underlying musculature (dynamic rhytides) versus those caused by intrinsic actinic damage (static rhytides) or fat herniation, which cannot be effectively treated by chemodenervation. There have been several articles on this subject, including a classification system used to help guide the practitioner on the anticipated outcome of various neck morphologies.[6]

Finally, we have also found Botox to be beneficial as an adjunct in brow lifts, lip augmentation, and laser resurfacing. Typically, we will chemodenervate a patient 1 to 2 weeks before the anticipated procedure to relax the muscular opposing forces and gain a more effective result. The combination of laser resurfacing and botulinum toxin chemodenervation is a powerful "one-two punch" in its effect on the effacement of rhytides in any region.

We congratulate Dr. Fagien on this outstanding landmark article. Although it was written 4 years ago, it continues to be referenced today, and its descriptions and techniques remain relevant. Dr. Fagien's ongoing refinements to his methods continue to be at the forefront of cosmetic surgery, and we look forward to his future publications.

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