By Hema Sundaram, MD

# A Practical Primer For Dysport, Part 2: Strategies for Success with the Periorbital Frame and Special Considerations for Skin of Color

Comprehensive patient assessment, a thorough understanding of facial anatomy, and careful consideration of treatment objectives are key to optimizing periorbital rejuvenation with botulinum neurotoxin A .

Patients seeking facial rejuvenation tend to have a general goal, such as looking younger or more rested, and also specific objectives, one of the most common of which is to improve the appearance of their eyes. The periorbital region is often the first area to manifest the signs of aging; some patients may develop rhytides on animation and under-eye hollows or pigmentation while still in their twenties. Aging around the eyes is insidious, and it is often difficult for patients to pinpoint exactly what has changed and is making them look older.[1] As clinicians, it is essential that we precisely identify these changes so that we can address them with the appropriate treatment modalities.

***The Periorbital Frame.*** I find it helpful to assess the eyes within a periorbital frame, which I define as encompassing the eyebrow, the upper eyelid, the lower eyelid and also the glabella and superior midface.[2] (Fig. 1). An individualized strategy for the injection of botulinum neurotoxin A (BoNT-A) within the periorbital frame can be formulated by coupling evaluation of each patient's muscle mass and activity and the extent and pattern of hyperdynamic and static rhytides with a thorough understanding of facial anatomy and the patient's treatment objectives. The need for adjunctive treatment with dermal fillers, laser, or light-based devices or chemical peels is determined by evaluation of periorbital volume loss, loss of skin elasticity and dyspigmentation (most commonly, hyperpigmentation). In addition, I employ other treatment modalities for integrative rejuvenation of the periorbital frame, including crystal-free microdermabrasion with skin epi-infusion (DermaSweep, CosMedic R&D, Inc.) cosmetic tattooing (permanent make-up), semi-permanent eyelash extensions (Xtreme Lashes) and eyebrow and eyelash tinting.[2]

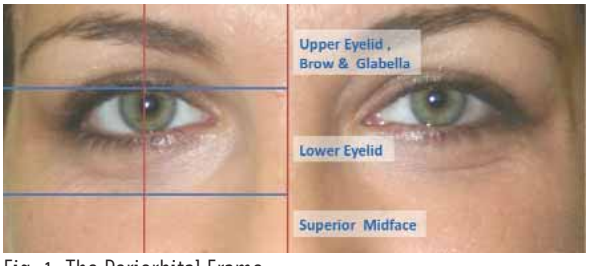


Fig. 1. The Periorbital Frame

***BoNT-A Products.*** I consider BoNT-A to be a cornerstone of periorbital rejuvenation, not just for treating crow's feet but also to shape and elevate the eyebrows where appropriate, to enhance eye shape through correction of age-related blepharospasm, and to treat rhytides in auxiliary areas within the periorbital frame such as the glabella. Injection strategies for Dysport (Abobotulinumtoxin A, Medicis) are essentially the same as for Botox Cosmetic (Botulinum toxin A, Allergan). The two BoNT-A products are FDA-approved for the same indication (temporary improvement of glabellar lines) and are identical in many respects, except for a difference in how treatment units are measured: Treatment units for Dysport are different to treatment units for Botox Cosmetic because the product manufacturers have different proprietary assays. Therefore, different numbers of Dysport Units (DU) or Botox Cosmetic Units (BU) are injected to achieve equivalent clinical results.

Despite their overall similarities, Dysport and Botox have a few unique characteristics that may be valuable when individualizing patient treatment. Selection of the appropriate BoNT-A product may be guided by specific patient characteristics and treatment objectives, as in the case presented below.

## Case Presentation

A 45-year-old black woman who worked as a travel agent presented complaining that she looked tired and old, especially around her eyes. She wished to improve the appearance of her eyes so that she looked younger. She reported significant sun exposure during her childhood in Africa and that she smoked a few cigarettes a week socially. She had no previous history of treatment with botulinum neurotoxin, dermal fillers, or other modalities of

facial rejuvenation. She wished to see rapid results from her treatment and to minimize the number of injections necessary to fulfill her objectives.

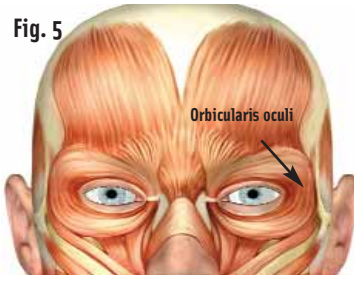
On examination (Fig. 2), this patient had Fitzpatrick skin type V. Assessment of the periorbital frame revealed mild ptosis of both upper eyelids and of the left eyebrow. In repose, she had mild rhytides of the lateral periocular region and moderate rhytides of the glabella; these rhytides became significantly more pronounced on animation (smiling and frowning) (Fig. 3-4). Her glabellar muscle mass, as evaluated at maximal frown, was medium. There was moderate volume loss from the lower eyelids, as evinced by prominent under-eye hollows, and there was patchy hyperpigmentation of the lower and upper eyelids. There was mild loss of skin elasticity throughout the periorbital frame.

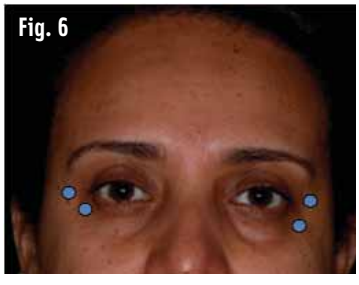
***BoNT-A Injection Strategy.*** This patient received injections of Abobotulinumtoxin A (Dysport) to improve her periocular and glabellar rhytides, to shape her eyebrows, and for eye-opening. Dysport was reconstituted with benzyl alcohol-preserved (bacteriostatic) normal (0.9%) saline to obtain a concentration of 200 DU per mL. For crow's feet and eye-opening, 10 DU (0.05 mL of reconstituted Dysport) were injected at each of two points into the right lateral periocular region and the same injections were made into the left lateral periocular region, for a total of 40 DU on both sides (Figs. 5, 6). For eyebrow shaping, 5 DU (0.025mL of reconstituted Dysport were injected subdermally at one point under the lateral edge of each eyebrow approximately 0.5cm above the orbital rim, for a total of 10 DU on both sides (Figs. 7, 8). To treat glabellar lines, 10 DU (0.05mL of reconstituted Dysport were injected at each of five points into the procerus and corrugator muscles, for a total of 50 DU (Figs. 9, 10). During the same treatment session, this patient also received Dysport

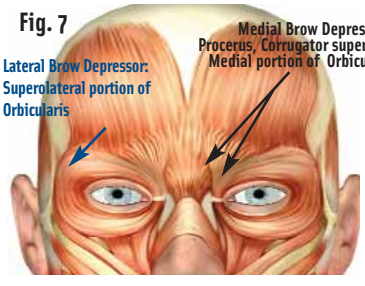
## Case 1: Treatment of Glabella and Forehead

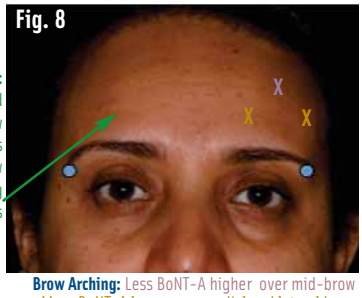



45-year-old African-American woman. Before Abobotulinumtoxin A (Dysport)therapy: **Fig.2.** In repose. **Fig. 3.** Frowning. **Fig. 4.** Smiling.



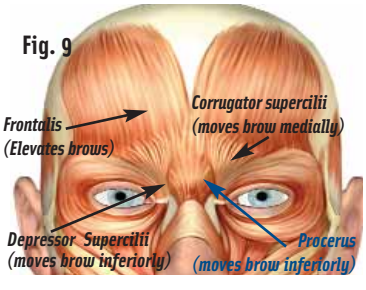



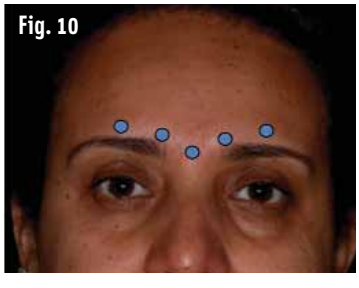



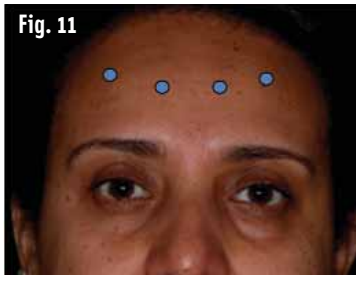

**Brow Lifting:** BoNT-A-mediated weakening of brow depressors allows unopposed brow elevation by Frontalis

**Brow Arching:** Less BoNT-A higher over mid-brow
More BoNT-A lower over medial and lateral brow




**Dysport Treatment**
**Crow's Feet and Eye Opening (Fig. 5, 6.):** 10DU at 2 injection points, each side.
**Brow Shaping (Fig. 7, 8.):** 2.5DU at 1 injection point, each side (●) plus 10DU to one central glabellar injection point (shown in Fig. 10). Possible injection points for Brow Arching are also shown ( X, X)
**Glabella and Forehead (Fig. 9, 10, 11):** Glabella: 10DU at each of 5 injection points. Forehead: 10DU at each of 4 injection points.



**Pre- and Post-Treatment Images, Post-treatment photos obtained at day 33.**


Glabella and brows: Patient in repose before (**Fig. 12, 14**) and after Dysport therapy (**Fig. 13, 15**).


Glabella and brows: Patient frowning before (**Fig. 16, 18**) and after Dysport therapy (**Fig. 17, 19**).


Full face: Patient in repose before (**Fig. 20**) and after Dysport therapy (**Fig. 21**). Patient smiling before (**Fig. 22**) and after Dysport therapy (**Fig. 23**).

*Figs. 1-23: Patient treated by Hema Sundaram, MD.*
*Photographic images courtesy of the PharmAdura CME initiative, Advances in Cosmetic Therapy–A Focus on Botulinum Neurotoxin A.*

injections to the forehead (Fig. 11), the transverse nasal rhytides, the marionette lines and to the neck. (Figs 5-8).

***Results.*** The patient reported onset of clinical effects within one hour of these injections, with progressive clinical improvement over the ensuing four days. At follow up six and 33 days after the Dysport injections, the patient reported that she was very happy with the results (Figs. 12-23). During the follow up appointment at 33 days, she received injections of small particle hyaluronic acid filler (Restylane, Medicis) to the lower eyelids and immediately below the lateral one-third of the eyebrows. She also received small and large particle hyaluronic acid fillers (Restylane and Perlane, Medicis) to the nasolabial folds, the oral commissures, and the pre-jowl sulci.

## Discussion

This patient received injections of Abobotulinumtoxin A (Dysport), a BoNT-A product that was FDA-approved for aesthetic use in April 2009, to several areas within the periorbital frame. Six US clinical trials of Dysport, conducted over the past seven

years in over 3,100 subjects, show that Dysport is the same as Botulinum toxin A (Botox, Botox Cosmetic, Allergan), a BoNT-A product that was previously approved by the FDA, in key respects, including FDA indication, batch-to-batch consistency, efficacy, safety and tolerability, lack of clinically significant antibody production, predictability of results and general strategy for placement of injection points.[3-7]

***BoNT-A Selection.*** The selection of Dysport for this patient was based upon consideration of the patient's stated desires to achieve rapid results and to minimize the number of injection points necessary to achieve these results. In regards to rapidity of results, studies of Dysport[6] show that the median time to onset of clinical effects is three days, with some subjects reporting onset of effect within 24 hours of injection, as did this patient. In regards to minimizing the number of injection points, I have found that this is sometimes possible with the use of Dysport, particularly when treating the forehead and the crow's feet.[8] This patient achieved excellent clinical results following Dysport injection at only two points on each side to her crow's feet and at only four points to her forehead. The rationale for this reduction in the number of injection points is that Dysport may have a slightly wider zone of activity (also referred to as field of effect) than Botox Cosmetic in certain situations. It is of note that this wider field of effect is not associated with any increase in adverse effects. Specifically, the incidence of eyelid ptosis (an indicator of undesirable spread or diffusion after glabellar injection), is low and comparable with both BoNT-A products: Combined data from Dysport studies show a ptosis rate of 2.1 percent, and the Dysport package insert reports a ptosis rate of two percent from a study of 398 subjects,[9] while the package insert for Botox Cosmetic reports a ptosis rate of five percent based on literature reports,[10] and a ptosis rate of 3.2 percent from a study of 405 subjects.[11]

**Practice Pearl: The Ideal Brow**

Female Brow
Gentle curve with lateral three-quarters rising above orbital rim.

Male Brow
Straight line at or slightly below orbital rim.

**Practice Pearl:**
**The Language of Dysport: The Rule of Tens and Fives**

*Glabella:* Inject 10 DU at each of the 5 standard glabellar injection points (Total 50 DU)
*Crow's feet:* Inject 10 DU at 2 to 5 points on each side (Total 40 to 100 DU on both sides)
*Forehead:* Inject 10 DU at 3 to 5 points (Total 30 to 50 DU)
*Brow Shaping:* Inject 2.5 to 10 DU on each side at 1 point (under lateral eyebrow margin)
*Eye Opening:* Inject 2.5 to 5 DU on each side at 1 point

- *Standard Dysport dose per injection point:* 10 DU
- *Smaller Dysport dose per injection point:* 5 DU
- *Smallest Dysport dose per injection point:* 2.5 DU (for eye-opening, conservative brow shaping and minor adjustment of previous treatment).

*As clinicians gain experience with Dysport they may wish to modify these suggested starter doses for more precise individualization of treatment.*

***Target Muscles.*** The target muscle for treatment of this patient's crow's feet was the orbicularis oculi, which was injected on each side with Dysport in the lateral canthus region. The inferior injection point on each side was intentionally placed just within the orbital rim to target the orbicularis oculi in this region and bring down the lower ciliary margin by a fraction of a millimeter, thus producing an appealing, wide-eyed look. More pronounced eye-opening may be achieved by injecting a low dose of BoNT-A subcutaneously into the lower pretarsal orbicularis just below the ciliary margin in the mid-pupillary line (Fig. 24, 25). BoNT-A injections to the lower eyelid within the orbital rim should be attempted only in patients with little or no loss of skin elasticity and with small doses of BoNT-A, to avoid lower eyelid droop and/or loss of the ability to close the eyelids forcibly due to over-weakening of the orbicularis oculi.

For brow shaping, the superolateral aspect of orbicularis oculi, which depresses the lateral aspects of the eyebrows, was injected with Dysport. Weakening of this lateral brow depressor allowed the relatively unopposed frontalis muscle to elevate the lateral aspects of the eyebrows. The patient's overall brow shape was also impacted by the Dysport injections into the frontalis itself, and into the procerus, corrugator supercilii and superomedial portion of orbicularis oculi. The lateral injection point on each side to the frontalis was placed slightly higher than the medial injection point on each side



**Eye-Opening as Part of Upper Face Rejuvenation with Dysport.** 57-year-old woman in repose before (**Fig. 24**) and 33 days after Dysport treatment (**Fig. 25**). Objectives of Dysport treatment, with primary target muscles in parentheses, were to improve lines on the glabella (procerus and corrugators), forehead (frontalis), and eyebrow shape (corrugators, procerus, orbicularis oculi ), to open the eyes (orbicularis oculi), and to improve crow's feet (orbicularis oculi) and marionette lines (depressor anguli oris). Subcutaneous BoNT-A injection points for eye-opening are shown. Slight descent of the lower ciliary margin, resulting in opening of the eyes , is evident after treatment. *Notes: This patient's treatment will be discussed in subsequent articles. Patient has permanent makeup (cosmetic tattooing) of eyebrows and eyelids in before and after photos.* ● = 2.5 DU each injection point.

*Figs. 24-25: Patient treated by Hema Sundaram, MD. Photographic images courtesy of the PharmAdura CME initiative, Advances in Cosmetic Therapy—A Focus on Botulinum Neurotoxin A.*

to weaken the lateral portion of frontalis at mid-forehead level less than the medial portion. Ideal brow shape and position are different for males and females (See Practice Pearl, previous page). I find that brow shaping and eye opening with BoNT-A are of particular value in optimizing aesthetic outcomes and patient satisfaction for females who are also receiving BoNT-A treatment to the glabella, forehead and crow's feet. For improvement of glabellar lines, Dysport was injected into the brow depressors, corrugator supercilii, procerus, and depressor supercilii.[2]

***BoNT-A and Skin of Color.*** The pattern of periorbital aging in patients of color differs from that of white patients in several respects. A full understanding of these differences is a pre-requisite for clinicians who wish to devise successful rejuvenation strategies for diverse patient populations. The periorbital frame of a patient of color tends to have better skin elasticity and fewer static rhytides; thus, at any given age, she may be perceived as looking less old than a white patient. A clinical approach that over-focuses on loss of skin elasticity and presence of static rhytides as hallmarks of periorbital aging is not relevant to skin of color; this may lead to under-diagnosis and under-treatment of aging changes with consequent patient dissatisfaction. It is essential to listen to patients' concerns, which generally center on what has happened to their faces as they aged; these changes from the baseline of youth serve as an invaluable aid for the clinician in assessing the individual aging process.

On clinical evaluation, I have found that the mass of the glabellar muscles and of other muscles of facial expression may be relatively greater in women of color than in white women of similar physiological frame and build. Dynamic rhytides may be prominent in the glabellar and lateral periocular regions, as in the case of this patient when she frowned or smiled, even when static rhytides are not pronounced in repose. Aging in skin of color is often characterized by volume loss, which contributes to ptosis of the eyelids and/or the eyebrows and under-eye hollows. This pattern of aging has given rise to the aphorism that skin of color ages by folding rather than by wrinkling. BoNT-A is a valuable component of the rejuvenation strategy for skin of color to address dynamic rhytides and to correct eyebrow and eyelid ptosis. I have observed greater longevity of injected BoNT-A in many patients of color, compared to white patients, perhaps due to intrinsic differences in the dermal structure and musculature of skin of color. This anecdotal observation is supported by a randomized, double-blind, placebo-controlled study in which subjects, including a subset of 106 African-Americans, received a single treatment of Abobotulinumtoxin A (Dysport) to the glabella with variable dosage based on gender and individual muscle mass.[7] The median duration of clinical effect was 117 days for the African-American subjects, compared to 109 days for the whole Dysport-treated study cohort. The response rate at day 90 after treatment was 70 percent for African-American subjects and 57 percent for the whole Dysport-treated cohort.

***Multimodal Periorbital Rejuvenation.*** Patients such as the one presented in this article, who have significant volume loss from the periorbital frame, benefit from the combined use of BoNT-A and dermal fillers. The synergistic benefits of combining BoNT-A therapy with hyaluronic acid fillers are well-documented.[12] I consider particulate hyaluronic acid fillers to possess the characteristics necessary to optimize both efficacy and safety when restoring volume to the periorbital frame, given that it is an anatomically and aesthetically unforgiving area. Specifically, particulate hyaluronic acid fillers are homogeneous, can be injected via small gauge needles with slow, controlled anterograde technique, and can be reversed if required through the injection of hyaluronidase or simple extrusion. In this patient, particulate hyaluronic acid (HA) fillers served as an adjunct to Abobotulinumtoxin A (Dysport) for brow shaping and for amelioration of age-related brow ptosis. HA fillers may also be used adjunctively with BoNT-A to maximize improve-

### Practice Pearl:
### BoNt-A Reconstitution with Preserved versus Unpreserved Saline

Reconstitution of a BoNT-A product with preserved (bacteriostatic) normal saline is off-label usage, because package inserts for both Dysport and Botox Cosmetic specify reconstitution with unpreserved normal saline. Two clinical studies (with 20 retrospectively studied subjects and 35 prospectively studied subjects) showed unaltered efficacy and reduced injection-associated pain when Botox was reconstituted with benzyl alcohol-preserved normal saline, and consensus recommendations for this product indicate that preserved saline is preferred for reconstitution.[15-17] In vitro enzyme-linked immunosorbent assay (ELISA) of Dysport reconstituted with benzyl alcohol-preserved normal saline and stored at 4° C with periods at room temperature to simulate storage conditions within a medical office setting has shown retention of 90 percent potency over the initial 24 hours after reconstitution and 80 percent potency from day 5 to day 12 after reconstitution. (Preliminary data on file, Medicis Pharm. Corp.)

ment in the glabellar region of patients who have deep furrows due to significant loss of volume and skin elasticity.

Conversely, Abobotulinumtoxin A (Dysport) served as an adjunct to the particulate HA fillers injected into the lower eyelid and lateral periocular regions of this patient by addressing dynamic rhytides. This may prolong the longevity of HA fillers injected into the lower eyelid by reducing shearing forces upon the fillers due to muscle overactivity. I have discussed specific injection techniques previously for volume restoration to skin of color.[13,14] The injection of dermal fillers into the lower eyelid may also improve hyperpigmentation of this area, which is a common feature of periorbital aging in patients of color. I can often further improve lower eyelid hyperpigmentation with a 470 to 980nm energy device that combines intense pulsed light and bipolar radiofrequency to target melanin (eMax, Syneron Medical), or through exfoliation with modified Jessner's chemical peels with retinoic acid (Vitalize peel, SkinMedica). The at-home use of an eye cream containing skin growth factors, antioxidants, peptides and iron chelators (TNS Illuminating Eye Cream, SkinMedica) may also be helpful.

## Conclusion

The eyes are such a centerpiece of the face that periorbital rejuvenation invariably produces a high level of patient satisfaction. The patients presented in this article were treated under the aegis of a new CME initiative, "Advances in Cosmetic Therapy-A Focus on Botulinum Neurotoxin A" (ACT). Through regional seminars and workshops, the ACT initiative (registration information below) provides a clinical and scientific overview of botulinum neurotoxin A therapy, including synchronized video of Dysport injection techniques and treatment results, new consensus recommendations for on-label and off-label aesthetic use of Dysport, and a review of previous consensus recommendations for Botox Cosmetic. CME programs like the ACT initiative facilitate a deeper understanding of the rationale and optimal strategies for aesthetic treatment with BoNT-A. This enables clinicians to rise to the challenge of advanced level facial rejuvenation with BoNT-A and to enjoy the immense gratification that results from performing it well. ■

*Dr. Sundaram serves on the Steering Committe for The PharmAdura Continuing Medical Education initiative, "Advances in Cosmetic Therapy - A Focus on Botulinum Neurotoxin A" (ACT), which is supported by independent educational funding from Medicis Pharmaceutical Corp. Physicians may register to attend a local ACT progam by calling 1-877-252-5100 ext.29 or by faxing information to PharmAdura, LLC. at 1-845-398-5108.*

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