Frontalis Treatment with Neurotoxin

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The only elevator of the forehead is the frontalis muscle, so chemical paralysis of the frontalis without treatment of the three depressors (orbicularis oculi, corrugator, and procerus) may lead to brow descent. This outcome is more commonly observed in the older individual and should be discussed with every patient, especially if the depressors are not simultaneously treated. Foreheads come in all shapes and sizes, and dosage is dependent on the physical size of the exposed forehead, patient gender, brow position, and wrinkle pattern (Figs. 128.1, 128.2, and 128.3). Men tend to have very active frontalis muscles that require larger doses (20–25 units) compared with women (15–20 units) in order to attain an effective and lasting result.[1] I have often exceeded these dosages, depending on the patient's specific anatomy and aesthetic desires.

When treating a forehead, one may avoid the areas immediately above the lateral tail of the hairy eyebrow, about one fingerbreadth distance above the eyebrow—the first time injecting a patient (as injection of the attenuated fibers of the frontalis in this region may lead to brow ptosis). If I see excessive activity in this area, I caution the patient that I will most likely need to do a "touch-up" (approximately 1 unit of BTX) in this area after 2 weeks, and I schedule to see the patient at this later date. Whenever it is possible, I ask patients to return after the first treatment of BTX 2 weeks later to ensure that there is not excessive ptosis or uneven peaking of the brows. In general, oftentimes I start with a much attenuated half dose of approximately 7.5 units linearly across the forehead just to manage the risk of peaky-looking ("Spock" "Jack Nicholson") eyebrows without risking excessively dropping the tail of the brows (Fig. 128.1). Men need treatment of the entire brow (unless they are already exhibiting brow ptosis laterally) and can tolerate mild brow ptosis in many cases as long they are forewarned about it. If concerned about the patient's reaction, the physician can avoid this area during the initial session. Women cannot tolerate any degree of brow ptosis for two reasons. First, lateral brow ptosis

[1] Units described are for Botox-brand (Allergan Inc., Irvine, CA) botulinum toxin that is diluted with 4 cc of preserved saline. Of note, preservative-free saline is painful for the patient and unnecessary.

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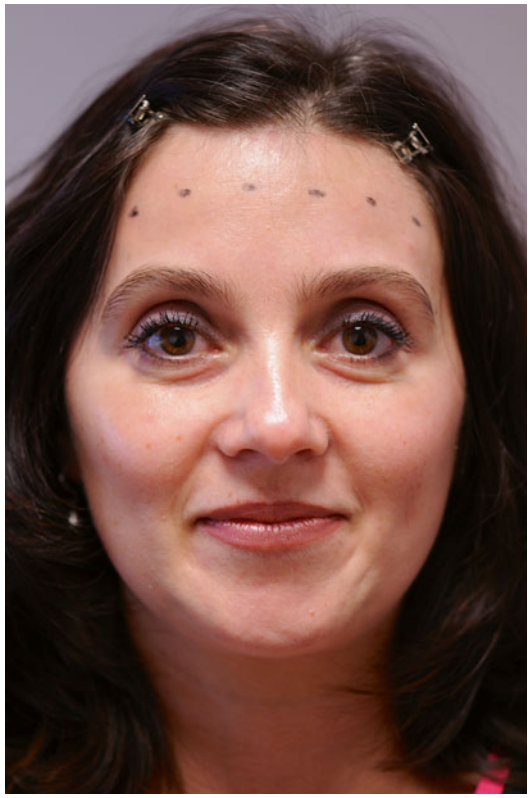

Fig. 128.1 *Dots* marked with an eyebrow pencil show the more conservative pattern of injection for a first-time patient in which all of the rhytids are not entirely managed but simply improved, but brow position is in most cases maintained and a peaky brow situation minimized. Each dot is equivalent to 1.25 units of Botox-brand botulinum toxin. The patient almost always receives treatment of the procerus, corrugator, and orbicularis oculi areas as well to maintain brow position

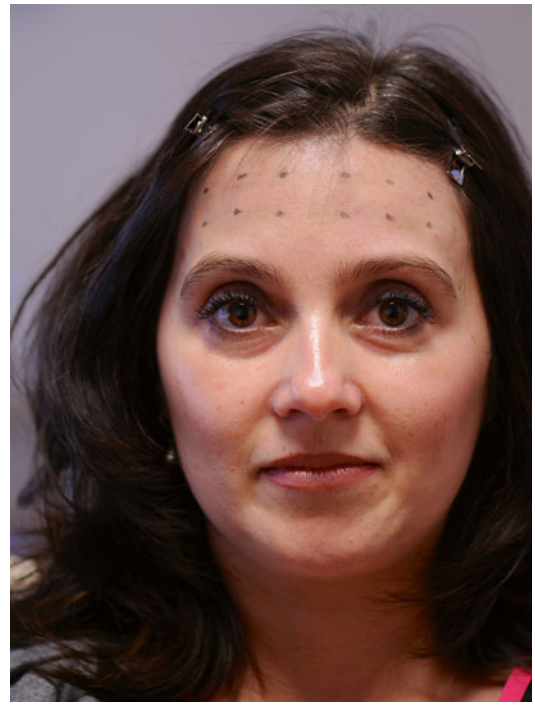

Fig. 128.2 *Dots* marked with an eyebrow pencil show the standard pattern for most women (and some men with a smaller forehead) that should provide a very even result in the forehead but carries with it some slightly increased risk of brow ptosis in those with a more deflated and incipiently ptotic brow. Each dot is equivalent to 1.25 units of Botox-brand botulinum toxin. The patient almost always receives treatment of the procerus, corrugator, and orbicularis oculi areas as well to maintain brow position

can masculinize the face. Second, women will notice even a millimeter of brow ptosis since they use magnifying mirrors and put mascara in the eyelid crease.

As a general rule, the maximal activity of the frontalis muscle occurs between the rhytids. However, I tend to achieve excellent results whether I inject immediately over a rhytid or between them. Also, many practitioners of BTX advocate not injecting the vertical midline of the forehead where the frontalis is either nonexistent or extremely attenuated. I believe that the midline need not be injected when there is an absence of rhytids in that area but should be addressed when rhytids prominently cross the midline.

I tend to distribute the neurotoxin across the forehead in multiple depots (12–20 sites) to achieve the most uniform results. I think treating the entire forehead with only a limited number of injections (no matter how large the total dose) fails to attain a smooth and durable result. I also do not like injecting the BTX deep past the galea, as doing so elicits discomfort and creates a crunching noise that is disconcerting to the patient. I have also noticed that the forehead can cause the most discomfort compared to treatment of the glabella and the orbicularis due to the multiple injection sites. Limiting the depth of penetration reduces discomfort. I also use ice liberally to reduce the pain of injection, but excessive ice can also cause pain when applied to the forehead. (I use ice cubes individually prepackaged in disposable plastic covers sold through the national

Fig. 128.3 *Dots* marked with an eyebrow pencil show a modified pattern for most women (and some men with a smaller forehead) that should provide a very even result but reduce the risk of brow ptosis in those with this predisposition but with slightly greater risk than shown in Fig. 128.1. Each dot is equivalent to 1.25 units of Botox-brand botulinum toxin. The patient almost always receives treatment of the procerus, corrugator, and orbicularis oculi areas as well to maintain brow position

chain, The Container Store.) When applying ice on the forehead, I have my assistant precede my injection site with the contained aforementioned ice pack to precool each site immediately prior to my injection. I follow my assistant's small ice pack as I progress across the forehead. I also use acupressure and vibration immediately prior to injection. With all these techniques, my patients have expressed great satisfaction and very little discomfort.