A Triangular Pattern for Botox Forehead Rejuvenation

The authors contend that their triangular pattern of Botox administration provides reproducible correction of both static and dynamic forehead wrinkles with minimal risk of brow and upper lid ptosis. Further, by varying dosage and injection technique, mimetic function may be preserved or obliterated. (Aesthetic Surg J 2006;26:617–619.)

Facial rejuvenation using botulinum toxin type A (Botox, Allergan, Inc., Irvine, CA) is currently the most sought-after aesthetic procedure in the United States. Ease of administration, lack of downtime, and relative efficiency in reducing facial rhytids account for its popularity. Complications are rare. However, patients may express dissatisfaction when treatment does not completely ablate wrinkles, or when brow or upper lid ptosis occurs. Further, some patients complain that the resulting total paralysis of the forehead and glabellar region does not allow for expressive facial movements. Here, we present patterns for Botox injection that provide facial rejuvenation, minimize the possibility of ptosis, and preserve some mimetic function, if desired.

Method

Reconstitute Botox in the standard fashion, so that you have a dilution of 3 units per 0.1 mL. Mark the patient anatomically (Figures 1 and 2):

- Place the first pair of marks, the “M” spot, 0.5 cm below the lateral brow on each side.
- Place the second pair of marks in the midpupillary line, halfway between the eyebrow and the frontal scalp on each side.
- Place the fifth mark at the vertex of the forehead.
- Place the sixth mark in the midline, just below the meeting of the eyebrows.
- Place the seventh mark in the midline of the forehead, halfway between the nasal radix and the vertex of the scalp.
- Finally, place a pair of marks over the corrugators, approximately 1 cm above the medial portion of each eyebrow.

These markings form a series of contiguous triangles. Inject 3 units of Botox in each of the areas of the corrugator and procerus muscles in the glabellar region and at the “M spot” if a chemical brow lift is desired. Three units may be injected at the frontalis muscle markings. Alternatively, using our extended pattern, stagger injections of 1.5 units (per injection) around the markings in the frontalis territory (Figure 3).

Results

We have corrected glabellar and forehead wrinkles using this pattern and have not noted any cases of brow and upper lid ptosis. Rarely will patients perceive their deformity as having been undercorrected and require additional Botox treatments.

Discussion

Unlike traditional surgical treatments for forehead and brow rhytids, Botox achieves results by altering the dynamic muscular forces that act on the upper third of the face. Complications of Botox administration may include ecchymosis; diplopia; incomplete eyelid closure; brow, eyelid and lip ptosis; and decreased tear expression. Anecdotal reports of eyelid spasm have also been documented. The efficacy of forehead rejuvenation using Botox has been well studied and reported in the literature.

Given the benefits of Botox, more and more health care providers from different areas of specialization are using it to treat aesthetic concerns. Because of providers’ varied training backgrounds, there is a need for standardized and systematic treatment methods. The triangular and extended triangular pattern of Botox administration represents a standardized method for forehead rejuvenation. Our techniques rely on the identification of clear...
anatomical landmarks, can be easily taught, minimize the possibility of complications, and yield pleasing, reproducible results.

Efficacy and low complication risk associated with any successful method of Botox administration are determined by relevant facial anatomy. The “M” spot (0.5 cm below the lateral brow on each side) corresponds with the underlying lateral and superior fibers of the orbicularis oculi muscles, which act as brow depressors. Injections superior to this point inactivate the inferior fibers of the frontalis muscle, yielding brow ptosis. Injections inferior to this point risk inactivation of the levator palpebrae muscle, causing eyelid ptosis. Injections 1 cm above the medial eyebrows, and midline injections just below the meeting of the eyebrows and midway between the nasal radix and the vertex of the scalp, paralyze the underlying corrugators and procerus muscle. It is important to note that traditional drawings...
of the corrugator muscles do not adequately define the extent and the width of the corrugator muscle. Our patterns address this concern, thereby eliminating the associated vertical glabellar and horizontal radix rhytids. The remaining injections in the frontalis muscle distribution eliminate the contribution of the frontalis muscle to forehead rhytids. All of the injection sites in the triangular pattern avoid the orbital rim where injections have been associated with eyelid ptosis, decreased tear expression, lateral rectus paralysis, and diplopia.

Maas and Kim reported in 2003 that they decreased the amount of Botox injection into the frontalis distribution (from 16 to 24 units down to 12 to 16 units) and increased the injection-free zone above the brow to 2 cm. This resulted in a decreased risk of brow ptosis with a concurrent increase in persistent rhytids. Our technique uses injections greater than 1 cm above the medial eyebrows, and we have not observed brow ptosis in any of our patients.

By adjusting dosing (3.0 units vs 1.5 units) and injection patterns (triangular vs extended technique), varying degrees of facial animation can be preserved. We have found that use of between 30 and 40 units is adequate for retention of mimetic function with decrease in static and dynamic rhytids; use of 50 units or more is necessary for complete obliteration of mimetic function. Many of our patients have found this flexibility to be a particularly appealing characteristic of our approach.

References