
Injection technique in neurotoxins and fillers: Indications, products, and outcomes



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Learning objectives

After completing this learning activity, participants should be able to describe the specific signs and symptoms that can be used to detect an incipient adverse event during or after injection of fillers and neurotoxins; describe the corrective strategies that can be initiated to mitigate the consequences of such an event; and identify demographic and other risk factors for such adverse events.

Disclosures

Editors

The editors involved with this CME activity and all content validation/peer reviewers of the journal-based CME activity have reported no relevant financial relationships with commercial interest(s).

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Injectable fillers and neuromodulators are used for a range of indications pertaining to the correction of facial aging and disfigurement. Fillers can correct soft tissue loss, depressed scars, and atrophy or asymmetry induced by systemic or local disease. Neuromodulators correct muscle-mediated skin creases, reshape the face, and address right–left functional asymmetry. Among the prepackaged injectable fillers approved by the US Food and Drug administration are hyaluronic acid derivatives, calcium hydroxylapatite, and poly-L-lactic acid; neuromodulators include three types of botulinum toxin type A and one type of type B. Adverse events associated with injections are typically mild, easily managed injection pain, followed by redness, swelling, and bruising. Asymmetry, nodules, ptosis, and intravascular occlusion are less common. Filler and toxin injections are part of a complete treatment plan. Reinjection is typically required to maintain the clinical effect, and combination treatment with laser and energy devices can enhance the aggregate effect. (*J Am Acad Dermatol* 2018;79:423-35.)

Key words: adverse event; asymmetry; Bellafill; Belotero; Botox; Dysport; filler; hyaluronic; indication; injectable; Juvederm; neuromodulator; neurotoxin; pain; Radiesse; Restylane; Sculptra; Xeomin.

RANGE OF INDICATIONS

Key points

- **Fillers have diverse indications, including the correction of age-related soft tissue loss, depressed scars, and atrophy or asymmetry induced by systemic or local disease**

- **Neuromodulators are used for the treatment of muscle-mediated skin creases, for reshaping of the face by selective muscle relaxation, and for the correction of right–left functional asymmetry**

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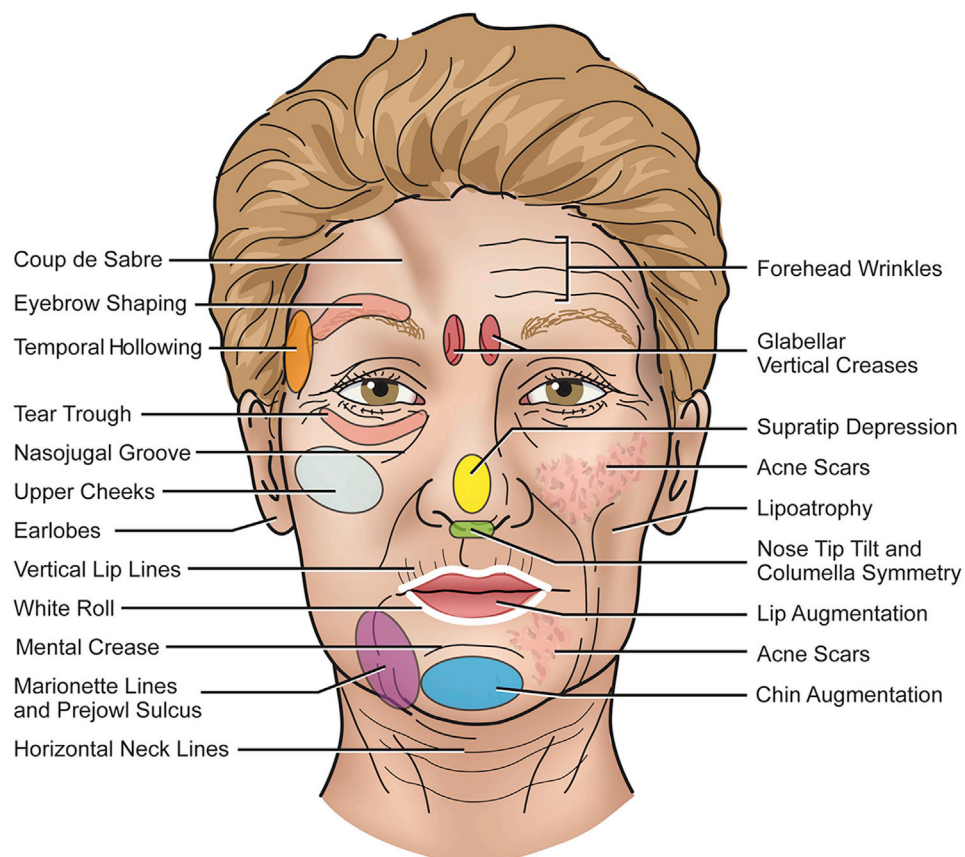


Fig 1. Common locations where filler materials are injected.

Although only a minority of routine uses are on-label according to the US Food and Drug Administration (FDA), temporary injectable fillers are medically indicated for a range of dermal and subcutaneous contour abnormalities (Fig 1).¹⁻¹⁶ On the face, fillers can correct aging-related volume loss causing forehead horizontal creases, glabella vertical lines, temporal hollowing, recessed eyebrows, upper cheek atrophy, tear troughs, nasojugal folds, midface atrophy, nasolabial folds, vertical lip lines, lip thinning, preauricular fat atrophy, earlobe thinning, marionette lines, mental creases, and jawline irregularities. Depressed scars, whether caused by disease, injury, or iatrogenic processes, are amenable to lifting with filler. While fillers are commonly used for rolling scars, other acne scars, including ice pick and boxcar scars, are also modifiable. Skin biopsy and surgical scars can be filled, with small nasal dorsal pits a particularly suitable indication. Primary and secondary subcutaneous fat atrophy, including coup de sabre, HIV lipoatrophy, and progressive hemifacial atrophy, are amenable to fillers. Other uses include the improvement of cicatricial ectropion and correction of right-left

facial asymmetry. Off of the face, fillers can smoothen scars and depressions. Body indications include horizontal creases of the neck (ie, “necklace” lines), fine rhytids of the upper chest and décolletage, and dorsal hand atrophy.

Botulinum toxins were first approved by the FDA for the treatment of glabella lines, but now are used for various aesthetic purposes (Fig 2) both on and off the face.¹⁷⁻³² Toxins can treat muscle-mediated dynamic horizontal forehead lines, periorbital smile lines (ie, “crow’s feet”), upper and lower lip vertical rhytids, and cobblestoned mental creases. Toxins can also reshape the face by selective muscle relaxation. Specific uses include upturning the upper lip, rounding a square mandibular contour, and widening the eye aperture to an almond shape. Injections can raise or lower a point on the face, thereby elevating the nasal tip, raising or lowering the brow, lifting drooping oral commissures, and lowering the lip to prevent show of the gums. Injections reduce scar formation in healing surgical or traumatic wounds. Like fillers, toxins can also correct facial asymmetries caused by disease, injury, or man-made causes. Off of the face, indications include platysmal banding upon tooth clenching and chest rhytids.

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