Are You Up-to-date on Dermal Fillers?

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The popularity of injectable fillers for aesthetic use continues to rise, and cosmetic injectors must select from an increasing range of options to achieve optimal outcomes. In addition to formulating a treatment plan and having an intimate knowledge of the facial anatomy, filler selection is critical along with an appreciation of both approved and off-label indications for these products. Appropriate patient selection and treatment technique can minimize adverse events (AEs) and allow for the best outcomes.

The US Food and Drug Administration (FDA) approved the first injectable hyaluronic acid (HA) filler in 2003, the first addition since the approval of bovine collagen in 1981. To date, there are now 4 groups of approved fillers: (1) HA (Belotero Balance [Merz North America, Inc], Juvèderm products [Allergan], Restylane products [Galderma Laboratories, LP], Resilient HA products [Revance Therapeutics Inc and Teoxane SA]), (2) calcium hydroxylapatite (Radiesse [Merz North America, Inc]), (3) poly-L-lactic acid (Sculptra Aesthetic [Galderma Laboratories, LP]), and (4) polymethylmethacrylate (Bellafill [Suneva Medical, Inc]).[1-3] Given the versatility of this wide portfolio of products, which often are used in combination with one another, we have advanced from the early goals of filling isolated lines or wrinkles on the face to the 3-dimensional restructuring of an entire treatment area. The increasing diversity of products, particularly the range of rheologic properties of HA fillers, allows the injector to strategically select the type of filler and depth of injection to achieve the desired treatment outcome. The duration of the treatment effects also is related to the properties of the filler.[4,5]

Advancements in injectable fillers also have led to new applications both on and off the face. Many pivotal clinical trials of fillers were performed in isolated anatomic areas, most commonly the nasolabial folds, leading to FDA approval of this indication. Other FDA-approved indications for fillers include lip augmentation (Juvèderm Ultra, Juvèderm Volbella, Restylane, Restylane Silk, Restylane Kysse), human immunodeficiency virus–associated lipoatrophy (Sculptra Aesthetic, Radiesse), volumization of the dorsal hands (Radiesse, Restylane Lyft), acne scarring (Bellafill), and age-related volume loss of the midface (Juvèderm Voluma, Restylane Lyft). Although it is considered off label, treatment of the temples, brows, tear troughs, jawline, horizontal neck lines, and etched-in radial cheek lines has been reported.[6-9] It is legal to use fillers to treat these areas, but data have not yet been evaluated by the FDA to officially grant their approval, which likely will change with the conclusion of many ongoing industry-sponsored trials.

Adverse events from filler injections range from the anticipated transient tenderness, swelling, and bruising, which are likely to resolve in a matter of days, to the most severe complications—intravascular occlusion with permanent sequelae, namely tissue necrosis, blindness or visual compromise, and stroke. It is critical to obtain written informed consent prior to proceeding with dermal filler injections. Masterful knowledge of the facial anatomy, in particular the location and depth of key vascular structures, is critical in minimizing these severe AEs. Injection technique, including use of a microcannula, can reduce the risk, in addition to administration of small volumes of filler at a time, aspiration prior to injection, and use of a retrograde injection technique. There also are variations in the predicted courses of vascular structures, as demonstrated in a cadaveric study showing 4 variants of the course of the angular artery.[10]

Hyaluronic acid fillers are the most commonly used of the available products, and hyaluronidase, which can dissolve the filler, can be utilized to manage emergent and nonemergent AEs.[11] Physical examination findings related to impending necrosis include blanching of the skin in the distribution of a key vessel with a mottled or reticulated

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purple discoloration. Hyaluronidase, on the order of hundreds of units, may be injected into the area of vascular compromise until reperfusion is achieved, in addition to administering aspirin and applying warm compresses to the area.[11,12] The most severe AEs are blindness and/or stroke, associated with findings such as immediate vision loss, pain, nausea, vomiting, and neurologic compromise. Although the glabella, nose, nasolabial folds, and forehead are the most common anatomic areas associated with these AEs (in order of frequency), injections in all areas of the face have been associated with blindness.[13,14] Retrobulbar and/or peribulbar injection of hyaluronidase for management of vision changes has been reported, but in most cases vision loss associated with dermal filler injections is not reversible.[14,15]

Nonemergent uses of enzyme reversal of filler placement include correcting undesirable aesthetic outcomes, such as asymmetry, misplaced filler, or even delayed granulomatous reactions. Hyaluronidase dosage should be determined by the amount and type of filler that was delivered to the patient. All HA fillers are not created equally, and evidence from dosing studies indicates that higher cross-linked and more cohesive fillers require higher doses of hyaluronidase.[11] For example, Juvèderm Voluma, created as a mixture of low- and high-molecular-weight HA, has a higher cross-linking ratio. Approximately 30 U of hyaluronidase are suggested to dissolve 0.1 cc of Juvèderm Voluma as compared to 10 U of hyaluronidase for 0.1 cc of Juvèderm Ultra and 5 U for 0.1 cc of Restylane.[11]

Treatment with dermal fillers generally is safe and effective, and as new fillers come to the market, we must identify how they will help further our goal of improving patient outcomes. The effects of coronavirus disease 19 on aesthetic medicine are still unclear, yet this uncertainty should not deflect treating clinicians from overlooking the fundamentals of dermal fillers. In addition to considering the appropriate use of each filler based on its unique characteristics and indications, we must be sure that we are prepared with the tools to manage any and all possible complications.

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