Facial Filler Complications

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KEYWORDS

• Facial fillers • Hyaluronic acid • Hyaluronidase • Complications • Granulomas • Biofilms • Necrosis • Blindness

KEY POINTS

- Identification of various filler-associated adverse events.
- Knowledge of tips to prevent filler-associated adverse events.
- Recognition of vascular occlusions: how to avoid them and how to treat them.

INTRODUCTION

Facial filler injections represent an ever-expanding market of nonsurgical facial rejuvenation. Second only to botulinum toxin type A injections, soft tissue fillers comprised 2.3 million procedures performed in the United States in 2014, a 4.5% increase from the previous year.[1] Approximately 78% (1.8 million) of these 2.3 million total dermal filler injections represent hyaluronic acid (HA) fillers. This specific popularity may be caused by the potential reversibility of the HA fillers with hyaluronidase, which allows injectors and patients the ease of dissolving unwanted filler.

Currently in the United States, the following substances have been Food and Drug Administration (FDA)-approved for treating facial rhytids: autologous fat, collagen (Evolence, Cosmoderm, Fibrel, Zyplast, Zyderm), HA (Restylane-L, Restylane Silk, Juvederm XC, Juvederm Voluma XC, Belotero Balance, Prevelle Silk, Elevess, Captique, Hylaform), poly-(L)-lactic acid (PLLA; Sculptra and Sculptra Aesthetic), calcium hydroxylapatite (Radiesse), and polymethyl methacrylate (PMMA; Bellafill, formerly known as Artefill).[2,3]

Although HA fillers have been touted to be safer and thus more widespread than the other filler types, all have been associated with adverse outcomes. These complications range from localized bruising, erythema, edema, migration, allergic response, the formation of small bumps underneath the skin, to more serious sequelae, such as permanent visual loss and nerve paralysis. Although not approved for domestic use, polyacrylamide gel and other non-FDA-approved substances are injected abroad and their complications are also often managed in the United States as travelers return from overseas.[4] Thus, awareness of the potential types of complications and options for management, in addition to the underlying facial anatomy, are imperative to delivering the best patient care.

The importance of hyaluronidase is being mentioned early in this article because of its value in treating a variety of the complications of facial fillers. Hyaluronidase has the ability to dissolve HA, which comprises most fillers injected in the United States.[1] Its activity was first described in 1929 by Duran-Reynals.[5] It is FDA-approved as a dispersion agent, usually for local anesthetics, which temporarily modifies the permeability of connective tissue through the hydrolysis of HA, a polysaccharide found in the intracellular ground substance of connective tissue.[6] It is not FDA-approved for dissolution of HA and therefore use

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in treating complications from facial fillers is considered off-label.

Hyaluronidase has been used in ophthalmology with retrobulbar blocks since 1978.[7] It is commercially available in the United States as Vitrase (ovine from Valeant) and Hylenex (human recombinant from Halozyme).[6] Hyaluronidase has even been suggested as a possibility to treat non-HA fillers with the idea that increased tissue compliance may allow a non-HA emboli to pass. Approximately 30 U of hyaluronidase are needed to dissolve 0.1 mL of HA. Restylane may resolve the fastest and Belotero the slowest relative to more cross-linking in the latter.[8] All HA fillers, however, should be degraded within 24 hours.[9]

POOR COSMETIC RESULTS

Overfilled lips and nasolabial folds do not convey an aesthetically pleasing, natural, or rejuvenated face (**Fig. 1**). To create visually favorable results, facial fillers are often injected off-label in nonapproved facial regions. Although most fillers are FDA-approved only for nasolabial folds, Restylane and Restylane Silk are approved for lip augmentation, Juvederm Voluma for midface restoration, Sculptra and Radiesse for facial lipoatrophy, and Bellafil for acne scar modification.[2,3] Radiesse is soon to be approved for hand rejuvenation.

Nodules can be noninflammatory or inflammatory. A noninflammatory nodule caused by too much filler in a certain location can be disintegrated with vigorous massage, dissolved with hyaluronidase, or even extruded with needle puncture by expressing the filler material out of the dermal tissue. Lumps and bumps from overfilling in a particular area often respond to simple massage. If they do not subside within 1 to 2 weeks, they can be dissolved with hyaluronidase.

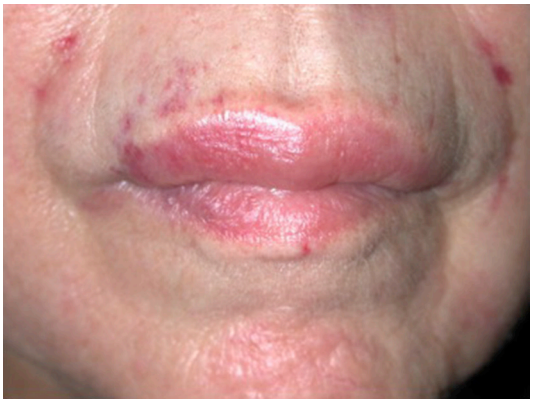

Fig. 1. Overfilled lips creating an undesirable aesthetic result.

Fillers also have the potential to migrate from the intended area of treatment.[10,11] Experienced injectors are attuned to observing filler track along tissue planes away from the site of a needle entry. Filler material can migrate to the inside of the lip (**Fig. 2**) or from a nasolabial fold down toward the vermilion border (Niamtu Cohen, personal communication, 2013).

A blue-tinted hue is often described with HA fillers and termed the Tyndall effect. The phenomenon describes multidirectional light scattering from particles in a colloid dispersion. Blue light is scattered more strongly and this color can become visible as the light passes through boluses of nonhomogenous filler within the skin. The term, despite its classic association with dermal fillers, may not actually be the proper term for this phenomenon because the molecules are too large for this to occur.[12] The true mechanism is yet to be elucidated. If this bluish hue is noticeable, the skin can often be punctured with a needle to express the nodule of filler without any complication (**Fig. 3**). Topical antibiotic should be applied immediately afterward.

Delayed edema surrounding areas of HA injection is a notable phenomenon because of its hydrophilic nature and osmolality. Juvederm tends to attract more edema than other products.[13] Griepentrog and colleagues[14] reported that about one in four patients with Restylane injected into tear troughs experienced some degree of perceptible edema.[15]

Chronic prolonged edema can also be related to a type 4 hypersensitivity reaction. If it is unresponsive to antihistamines, it may need to be dissolved with hyaluronidase (**Figs. 4–6**). Angioedema is an immediate allergic response that can last for several weeks. It may respond to antihistamines or prednisone.[16]

Bruising is a complication of any procedure that involves the use of a needle or cannula. There is debate as to whether or not one should stop anticoagulants for patients receiving fillers.[17] For

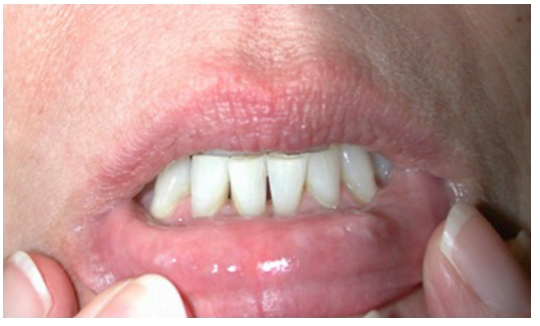

Fig. 2. Migration of filler material within lower lip.