

The SPA results align with other patient-reported outcomes from the same study. For example, most patients rated their hands and décolletage as “improved” or “much improved” on the Global Aesthetic Improvement Scale out to 12 months of follow-up.¹

The mechanisms responsible for skin aging and how it is perceived include environmental factors (e.g., sun exposure) and biological aspects (e.g., nutrition). In addition, there is likely to be a substantial genetic element. A recent genome-wide association study identified 74 genetic loci that were independently associated with perceived aging—primarily in regulatory networks relevant to the skin.⁵ The largest effect size of a minor allele was from an intronic variant of the *MFAP4* gene, encoding a glycoprotein involved in elastin fiber organization within the extracellular matrix.³ Patients with this variant are more likely to feel older than they are and hence HA filler injection could be especially valuable.

Irrespective of underlying genetics, the improvements in SPA in this analysis are particularly important given that mitigation of aging is a key reason for wanting these treatments in the first place. In a recent prospective, multicenter analysis of more than 500 patients, the most commonly cited motivation for seeking aesthetic procedures was to look younger and fresher.² Thus, improving how patients perceive the age of their own appearance is central to a successful outcome. This may be particularly important with the hands, which many women conceal because they are self-conscious about signs of aging.

Furthermore, it is possible that the impact of treatment could go beyond the psychological and into physical well-being. It has been reported that self-perception of being old, or negative changes in SPA, is predictive of increased long-term mortality risk.⁴ These effects are not well understood in the context of aesthetic treatment with injectables but merit further study.

Conclusions

Helping patients to look and feel younger is central to the purpose of aesthetic treatment with fillers, but this effect has not been extensively assessed outside the face. In this study, injection of the hands and décolletage with VYC-17.5L led to substantial, rapid, and durable improvements in patients' SPA. Greater focus on treating these areas may be warranted.

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Unusual Intraoral Necrosis After Hyaluronic Acid Injections

Vascular compromise related to noninvasive facial aesthetic procedures with filler is a major concern. Although fillers are generally considered safe, complications may occur. Facial vascular complications are one of the most severe and feared immediate complications, resulting from interruption of the vascular supply to the area by direct injury to the vessel, compression of the area around the vessel, and/or obstruction of the vessel (embolization) by the filler material.¹ Once the small droplets of filler have entered an artery, the embolic material is commonly carried distally in the normal direction of blood flow and progressively into smaller-sized vessels, until the material can no longer pass any further distally, resulting in complete obstruction leading to tissue necrosis or transient or permanent visual loss or impairment, in the case of ophthalmic artery involvement.^{1,2}

A 42-year-old Caucasian woman with no history of previous surgical rhinoplasty came to the author complaining about her nasal appearance, with the aim of enhancing nasal aesthetic using hyaluronic acid (HA) injections. The injections were performed above the anterior nasal spine (ANS) and the nasal bones. An injection of HA was performed in an office-based setting, and the patient was discharged at the end of the procedure.

On follow-up, which was performed 1 week later, vestibular gingival necrosis of the upper right incisor accompanied by partial lip mucosa necrosis was observed (Figure 1). Moreover, an exophytic palatal lesion was identified (Figure 2). The patient reported that the development of the gingival lesion appeared the day after HA injections, but she did not correlate it with the injections



Figure 1. Gingival and labial necrosis identified 1 week after HA injection. HA, hyaluronic acid.

themselves: for this reason, she was referred to a dentist who suggested a diagnosis of gingivitis, suggesting local application of chlorhexidine gel once daily. The palatal lesion was not observed by the dentist.

As soon as the patient was observed, 1 week after the procedure, it was assumed that intraoral lesions could be related to the ANS injections. Consequently, hyaluronidase was injected and oral antibiotics, antiplatelets, and corticosteroid therapy were prescribed. The day after, hyaluronidase was injected again. Four days after the last hyaluronidase injection, the clinical appearance of the gums was improved and the palatal lesion had disappeared (Figure 3). Fourteen more days later, the gum had completely healed (Figure 4).

Discussion

Even when administered by experienced hands, injectable fillers can cause various unintended reactions, ranging from minor and self-limiting responses to severe complications, such as skin necrosis. The nose, glabella, nasolabial folds,



Figure 2. Palatal exophytic lesion identified 1 week after HA injection. HA, hyaluronic acid.



Figure 3. Palatal lesion disappeared 4 days after the second hyaluronidase injection.

and forehead are the most dangerous areas to be injected because of their rich local vascularization.^{1,2}

The vascular supply of the internal nose is from the septal branch of the superior labial artery, the posterior septal branch of the sphenopalatine artery, the septal branch of posterior ethmoidal artery, and the medial internal branch of the anterior ethmoidal artery (See **Supplemental Digital Content**, Figure S1, <http://links.lww.com/DSS/A811>). It has been demonstrated that the entire ipsilateral septal mucoperichondrium can be transferred with a narrow pedicle containing the septal branch of the superior labial artery.³ Similarly, based on the anterior and posterior ethmoid arteries, the entire contralateral mucoperichondrium can be turned laterally as a dorsally based hinge flap to line the sidewall of the nose.⁴ Moreover, if both the right and left septal branches are included in the pedicle, the entire septum can be rotated out of the nasal passage as a composite flap containing a sandwich of cartilage between the 2 mucoperichondrial leaves.³ Because of the anatomy of arteries feeding the internal nose, it was assumed that gingival necrosis observed in this case report could be related to an embolization of the septal branches of the superior labial artery and a compression/embolization of the distal arteries coming from septal branch of posterior ethmoidal artery.³ The possible cause of gingival necrosis



Figure 4. The gum completely healed 22 days after HA injection and 14 days after the last hyaluronidase injection. HA, hyaluronic acid.

after HA injections above the ANS could have been a high-pressure injection. This could have embolized the septal branch of superior labial artery in a retrograde fashion allowing a dispersion of the filler between the septum and the perichondrium, and this then could have occluded the terminal branches of the septal branch of the posterior ethmoidal artery. Hyaluronidase was only injected above ANS 1 week after the primary HA injections, and within a few days, the clinical case had completely healed. Thus, this evidence allows us to suspect that gingival necrosis and the palatal lesion could be related more to compression of the terminal branches of the septal branch of the posterior ethmoidal artery, rather than a retrograde embolization of the septal branch of the superior labial artery, although clinically the necrosis involved not only the gum but also the inner part of the lip.⁴

Besides the scientific interest surrounding this complication, this case allows us to understand that a more exhaustive explanation of possible complications, especially the ones that could happen far from the injection site, should be communicated to the patient to treat them as soon as possible. It is best to have an “open mind” and to perform a complete clinical history. This would allow the understanding that a lesion in the mouth could be related to a nonsurgical facial aesthetic procedure.

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Dermal Filler-Induced Vascular Occlusion Successfully Treated With Tadalafil, Hyaluronidase, and Aspirin

Necrosis is a serious complication of dermal filler injection for facial aesthetic enhancement. It occurs from vascular compression or inadvertent entry of the needle into the arterial blood supply, resulting in distal particle embolization and ischemia.¹ Previous scarring in the area that is to be injected provides a point of fixation for vessels, thus increasing the risk of needle penetration.¹ We report for the first time, the successful off-label use of oral tadalafil in facilitating resolution after dermal filler-induced arterial occlusion in a previously scarred region.

The literature recommends the use of multiple therapies simultaneously to mitigate the dire complication of necrosis. The mainstay of treatment is injection of hyaluronidase followed by massage, which decreases pressure in the anatomic compartment by dissolving both endogenous hyaluronic acid—irrespective of the dermal filler type used—and injected hyaluronic acid.^{2,3} Oral aspirin prevents clot propagation in the setting of compromised vasculature.^{2,3} In addition, the use of warm compresses and vasodilating agents may hasten resolution with an improved final cosmetic outcome.^{2,3} Topical

nitroglycerin paste is commonly added for vasodilation of small arterioles, but its half-life of several minutes results in rapidly diminishing therapeutic effect, requiring multiple repeat applications.^{2,4} Alternatively, the use of oral sildenafil, a phosphodiesterase-5 (PDE-5) inhibitor with a half-life of four hours, to treat dermal filler-induced vascular occlusion, is reported in the literature.² To the best of our knowledge, the use of oral tadalafil, a PDE-5 inhibitor with a half-life of 17.5 hours, for extended vasodilation in a suspected arterial occlusion, has not been demonstrated.⁵

A 29-year-old female patient presented for injection of dermal filler in the lips. She had an atrophic scar at the superior edge of her right upper cutaneous lip from prior trauma. She requested correction of this defect with dermal filler. A hyaluronic acid dermal filler (JUVÉDERM Ultra XC) was injected to augment lip volume and improve the cosmesis of her scar. Two hours after the procedure, the patient reported intense pain, and her right upper mucosal and cutaneous lip appeared blanched with an overlying pale blue tinge (Figure 1). The patient was instructed to take oral aspirin