METHODS AND MATERIALS: Sprague Dawley rats were injected subcutaneously with two HA fillers, VYC-20L [20 mg/mL] or HYC-24L+ [24 mg/mL], to create a projecting bolus. Four days post-injection, recombinant human hyaluronidase (HX) or ovine hyaluronidase (VIT) were administered at varying dose levels (5U/0.1mL bolus, 10U/0.1mL bolus, and 30U/0.1mL bolus). 3D images were captured to quantify the loss of projection at six time points over 72 hours. Histology was performed to confirm degradation at 2 weeks post-administration.

RESULTS: For both HA fillers, complete loss of projection was achieved with the highest dose of HX and VIT. More projection (i.e., less degradation) was detected with the lower doses of HX and VIT. No significant differences in the resulting projection were observed when comparing the effect of HX to VIT (at any dose level) or the degradation response of VYC-20L or HYC-24L+ to either hyaluronidase. The histology showed significant loss of filler material at 2 weeks, with minimal amounts of filler observed.

CONCLUSION: The in vivo susceptibility of HA fillers to hyaluronidase-induced degradation has not been investigated previously. This novel animal model evaluated the susceptibility of fillers with different physicochemical properties to commercially-available hyaluronidases. Using an animal model allowed degradation to be evaluated while incorporating variables introduced by the biological environment (e.g., clearance, competing substrates for hyaluronidase). The results showed that the projection detected by 3D imaging was able to be reduced to non-detectable levels for both fillers. A dose-dependent response was observed, suggesting that the amount of degradation can be varied. Additionally, the same degree of degradation was observed for both commercially-available hyaluronidases and, despite differences in physicochemical properties, the same degree of degradation was achieved for both VYC-20L and HYC-24L+. These outcomes confirm that enzymatic degradation of HA by exogenous hyaluronidase is not hindered by the physicochemical properties of the fillers when evaluated in vivo.

INTRODUCTION: Nasolabial complex (NLC) rejuvenation with injectables is limited by densely adherent perioral and nasolabial crease tissues. Release of myodermal attachments may create a potential space for filler deposition, attenuating deep nasolabial creases associated with aging. Incisionless separation of these attachments has been described using subcision wires1. Adjunctive filler injection may promote a youthful nasolabial contour2. The anatomic basis for these techniques is not fully defined. This study histologically describes nasolabial wire subcision with and without filler placement compared to filler injection alone.

METHODS: Of fourteen NLCs in seven fresh cadavers, eleven NLCs were subcised (SurgiWire Incisionless Dissector, Coapt Systems, Inc.), eight also underwent filler injection. One NLC was injected without subcision. Two were controls (no intervention). Injectable silicone (Dragon Skin, Smooth-On, Inc.) simulated dermal filler, and 2mL were injected per NLC. Full thickness portions of the lip and cheek containing the NLC were excised. Specimens were sectioned perpendicular to the nasolabial crease, stained with Masson’s trichrome, then assessed in thirds (upper, middle, and lower).

RESULTS: Mean cadaver age was 72.7 years. Five (71%) were female. Mean length of the nasolabial crease was 41.2 mm. Subcision/filler cavities were localized to a plane superficial to the facial mimetic musculature in 80.6% of sections. When compared to subcision alone, subcision combined with silicone filler generated larger, smooth-walled subcision cavities with division of myofascial elements. Filler injection without subcision resulted in irregular silicone deposition amongst multiple filler cavities. Vessels in excess of 300um diameter were disrupted in 3 specimens (25%) and 13 sections (14.1%). Vessel disruption was more frequent in the middle and lower thirds of the NLC, and 61.5% of vessel disruptions were observed during filler injection without subcision. Vessels exceeding 1000um diameter were identified in 5 specimens (35.7%) and 13 sections (8.4%). These larger vessels were always inferior or lateral to the subcision/filler plane, and in the middle/lower thirds of the NLC. No large vessel disruptions or intravascular filler were observed.

CONCLUSIONS: Wire subcision reproducibly divides muscular and connective tissue attachments to the nasolabial crease. Vessel disruption during subcision was uncommon, more frequently observed in the middle/lower thirds of the NLC. Vessels exceeding 1000um diameter were more frequently observed in the lateral aspect of the lower third of the NLC which is considered a vascular danger zone.

Anatomic and Histologic Investigation of Nasolabial Rejuvenation with Wire Subcision and Adjunctive Filler Injection

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Emerging Applications of Three-Dimensional Printed Models in Rhinoplasty

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INTRODUCTION: Two-dimensional (2D) photography has traditionally facilitated preoperative analysis and surgical planning for plastic surgeons. While this has historically been standard of care, recent technological advances have propelled plastic surgery innovation forward, transitioning from traditional 2D photography to a more comprehensive and realistic modality, using three-dimensional (3D) imaging and printing. With the advent of 3D imaging in facial aesthetic surgery, the plastic surgery community has primarily focused on its utility in preoperative surgical simulation and marketing, however, the application of 3D photography extends well beyond virtual simulation. This study highlights the clinical value of 3D printed models in helping to align patient and surgeon goals in the preoperative and consultative setting, and focuses on the value of custom surgical templates for use as operative blueprints to facilitate intraoperative decision making in rhinoplasty.

MATERIALS AND METHODS: Patients undergoing rhinoplasty had standard 3D photographs (Canfield Vectra H1) taken as part of their preoperative visit. Using Vectra, 3D digital renderings of the simulated postoperative result were created. Finally, both baseline and ideal simulated 3D printed models were created as individualized surgical templates for intraoperative guidance during rhinoplasty surgery.

RESULTS: 3D printed individualized surgical models have been successfully implemented for use during cosmetic rhinoplasty. The intraoperative application of 3D printed models surpasses not only traditional 2D photography, but also simple 3D computer renderings. The realistic facial prototypes enable the surgeon to have a more intuitive perception of patient-specific soft tissue and bony contours to help achieve superior aesthetic results.

CONCLUSION: 3D printing is an emerging technology in aesthetic surgery, and while it permeates the aesthetic market, there is an opportunity for surgeons to incorporate personalized models of patients into their practice for use as intraoperative guides. Realistic facial prototypes enable the surgeon to interact directly with models of patient-specific soft tissue and bony contours to facilitate nasal reconstruction, while optimizing aesthetic outcomes. The introduction of 3D photography as an adjunct to surgical planning has demonstrated impressive applicability, and provides a unique opportunity for aesthetic plastic surgeons to replace traditional 2D photographs, while better aligning patient and surgeon desires. Additional randomized control studies are needed to further elucidate the benefits of this technology, however, we believe this technique represents a paradigm shift and will become standard of care in the years to come.

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Beard Reconstruction - A Surgical Algorithm

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BACKGROUND: Facial defects with loss of hair-bearing regions can be caused by trauma, infection, tumor excision, or burn injury. Several techniques, including local-, loco-regional-, and free flap transfers have been described. This analysis evaluates different surgical approaches with a focus on male beard reconstruction, emphasizing the role of tissue expansion of regional and free flaps.

METHODS: Loco-regional and free flap reconstruction were performed in 11 male patients with 14 facial defects affecting the hair-bearing buccal-mandibular or perioral region. In order to minimize donor site morbidity and