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ABSTRACT

We describe the treatment of lower eyelid cicatricial ectropion in a 24-year-old male using volumizing hyaluronic acid (HA) filler. One milliliter of Juvéderm Voluma® (Allergan) was injected directly under the skin in each lower eyelid to create a large bubble. The filler was dissolved with hyaluronidase (750 I.U. / side) 5 months later, achieving an excellent and stable functional and cosmetic result. There was a 2.4 mm improvement in MRD-2 with the filler in place, which decreased to 1.72 mm at 6 months after filler dissolution with hyaluronidase. This resulted in complete resolution of the signs and symptoms of corneal exposure. To date, there have been reports of low density HA injection for the treatment of cicatricial ectropion when injected in the subcutaneous and suborbicularis oculi plane to support and expand the lower eyelid skin. However, the Tyndall effect is frequent and the injections have to be repeated every 8 to 10 months. We herein report a case of temporary placement of a volumizing hyaluronic acid (Juvéderm Voluma®, Allergan, Parsippany, NJ), directly under the skin with the goal of permanent tissue expansion in a patient with cicatricial ectropion secondary to skin-only deficiency following xanthelasma excision. Patient consent was obtained prior to initiating treatment. The risks, benefits and alternatives regarding this procedure were explained to the patient. This case report adheres to the principles of the Declaration of Helsinki, and is in full compliance with the standards of Health Insurance Portability and Accountability Act.

Case report

A 24 year old male, computer programmer was referred for evaluation to the oculoplastics clinic for a 10 month history of bilateral eye irritation and tearing, despite using artificial tears more than four times daily. Patient’s past surgical history was pertinent for excision of bilateral lower eyelid xanthelasma, one year prior by an outside ophthalmologist. Ocular examination revealed a corrected visual acuity of 20/20 OU. The external exam showed 2 mm OD and 3 mm OS of inferior scleral show and an average MRD-2 of 8.4 mm. The patient also exhibited 2mm OD and 3mm OS of lagophthalmos, as well as bilateral lower punctal eversion (Figure 1A). These signs were not reversible with manual horizontal tightening of the eyelids. On slitlamp examination he had 2+ punctate epithelial erosions inferiorly in both eyes. A diagnosis of bilateral lower eyelid cicatricial ectropion...
was made and surgical correction was proposed. The patient, however, declined further surgical intervention and requested a non-invasive solution that is likely permanent and has no downtime. We proposed lower eyelid subcutaneous injection of a volumizing hyaluronic acid filler for skin expansion. Dissolution of the filler with hyaluronidase was planned for 3 months following HA injection. The negative aesthetic consequences of tissue expansion with the filler in place were discussed with the patient who agreed to the therapeutic plan, including the off-label use of Juvéderm Voluma®.

We chose Juvéderm Voluma® (Allergan, Parsippany, NJ) because of its hydrophilic and high G characteristics. Prior to the procedure the skin of the lower eyelids was disinfected with hypochlorous acid 0.01% and lidocaine cream 2.5% was applied directly on the lower eyelid skin for 10 minutes. No further anesthetic was needed since Juvéderm Voluma® contains lidocaine as part of its formulation. One syringe of 1 milliliter of Juvéderm Voluma® was injected directly under the scar subcutaneously above the orbicularis oculi muscle plane with a 27G needle in each lower eyelid which resulted in a very irregular filling initially, because of the scar (Figure 1B), that evolved into a large, homogeneous bubble in less than 48 hours (Figure 1C). The HA was distributed within the three thirds of the lower eyelids in unequal parts focusing mostly under the old surgical scars. The injection sites coalesce into a bubble given the hydrophobic properties of this high G’ volumizing hyaluronic acid filler. It is important to note that although infiltration of HA with a cannula reduces the risk of a hematoma and increases patient comfort, a 27G needle was preferred given its fine profile and ability to dissect directly under the subcutaneous plane. Given the high lift properties of Juvéderm Voluma there was no increase in the MRD-2 distance after infiltration regardless of the increased volume in the lower eyelids.

We measured the MRD-2 distance (distance from the corneal light reflex to the lower eyelid margin) in each eye using the Image-J software (NIH, Bethesda, MD) where the limbus to limbus distance was normalized to a value of 12 mm so that all images could be be compared. The MRD-2 distance was measured in both eyes and averaged for each picture.

The average MRD-2 before filler injection was 8.2 mm. This decreased to 6.0 mm after filler injection. This resulted in complete resolution of the signs and symptoms of corneal exposure. At the patient’s request, the filler was left in place for 5 instead of 3 months. The filler was completely dissolved by injecting 750 i.u. of hyaluronidase (Desinfiltral, Girona, Spain) per side (Figure 1D). Six months after hyaluronidase injection, the average MRD2 was 6.68mm (Figure 2B). The patient’s...
lagophthalmos and exposure keratopathy were completely resolved and the patient remained asymptomatic for at least 9 months after the hyaluronidase injection.

**Discussion**

As far as we are concerned, this is the first report describing the off-label use of a volumizing hyaluronic acid filler as temporary tissue expander in the treatment of lower eyelid cicatricial ectropion, following its complete dissolution. One milliliter of Juvederm Voluma® was injected purposefully in the subcutaneous plane above the orbicularis oculi muscle in each lower eyelid in order to create a large expansion bubble and leave it in place for 5 months. Six months after the filler was completely dissolved with hyaluronidase, the MRD-2 increased by only 0.68 mm. If we consider the MRD-2 improvement of 2.40 mm with the filler in place as ideal (or 100%), because of complete resolution of the inferior scleral show, the final MRD-2 of 1.72 mm represents a 72% improvement from the pre-expansion state. This allowed for the complete resolution of all signs and symptoms of corneal exposure, furthermore no punctate epithelial erosions were noted upon examination.

In contrast to Fezza, Goldberg, and Romero, we used a volumizing hyaluronic acid filler (Juvederm Voluma®) in order to create a large bubble under the skin for tissue expansion. We did not try to avoid the Tyndall effect, but purposefully induced one in order to get the maximal skin expansion in the minimal amount of time. In other parts of the body and in different conditions such as post-mastectomy patients undergoing reconstruction, burn victims and congenital tissue aplasias, saline filled bags are frequently used as tissue expanders. The saline filled bags are left in place for 40 days to 2 months in the case of post-mastectomy tissue, and 1-2 months for burn scars.

In our case, the filler was left in place for 5 months due to the detrimental effect of gravity on the lower eyelid position and at the patient’s request. The average age of the patient population in Fezza’s and Romero’s paper was 76 and 77.8 years of age, respectively; whereas our patient was only 24 years old and consequently with a less distensible skin. For this reason, a large bubble and longer time were thought to be necessary for achieving adequate skin expansion. In the future, we are planning on leaving the filler in place for 3 months, in our older patients.

Litwin et al. reported the use of Restalyne® HA in 3 patients with cicatricial ectropion secondary to ichthyosis. Their patients were 3-4 month old infants with a systemic condition. Given the recurrent nature of ichthyosis, the patients in their case series required repeated injections every 9 to 16 month. Although there was a 0.6 mm increase in MRD-2 over the first 6 months after hyaluronidase injection, our patient continues to be symptom free including no signs of corneal exposure, and has not yet required another filler injection.

To our knowledge this is the first reported case of the use of volumizing hyaluronic acid filler as tissue expander for the correction of lower eyelid cicatricial ectropion, with sequential dissolution of the filler. Subcutaneous placement of Juvederm Voluma® for 5 months can be used safely and effectively as temporary tissue expander in lower eyelid cicatricial ectropion. The treatment resulted in complete resolution of the signs and symptoms of corneal exposure and a stable improvement in MRD2. It also diminishes the need for a skin graft, which in a young patient would translate into an unaesthetic surgical result with thickening of the lower eyelid skin. We believe that this treatment modality is definitive since proper expansion of the anterior lamella is achieved.

**References**