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The case of the eyelid silicone granulomas

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ABSTRACT

Foreign body granulomas can develop even several years after autologous fat or filler injection. In some instances the foreign body granulomas have been found at sites other than the original injection site. We present a case of a 48-year-old male with reported “hyaluronic acid fillers” injected into his upper and lower eyelids several years prior. He subsequently developed periorbital swelling with negative allergic and rheumatologic workup. The patient ultimately underwent a blepharoplasty for improvement of the swelling. Histopathology suggested silicone granulomas of the upper and lower eyelid. This case illustrates the importance of keeping foreign body granulomas on the differential for all patients with a history of facial dermal filler injections. Although hyaluronic acid is the most common dermal filler, providers should suspect the use of other dermal fillers including those not FDA approved particularly when common conservative treatment methods are not sufficient.

1. Introduction

Filler injections are commonly performed by facial plastic surgeons and otolaryngologists, as well as by dermatologists, ophthalmologist, plastic surgeons, and in some instances general practitioners, obstetricians, and nurses [1]. Reports suggest an increase in primary care providers who provide injectables, and now compose up to one third of injectors [2]. Dermal fillers have a number of indications such as reducing fine lines and wrinkles and improving facial contour and projection [3]. Temporary fillers naturally breakdown or are metabolized by the body over time. Types of temporary fillers include Hyaluronic acid (HA), calcium hydroxyapatite, and collagen. Products such as Poly-L-lactic acid (PLLA) and polymethylmethacrylate (PMMA) are fillers that are stimulatory and lead to collagen formation [3,4]. The most common fillers currently are the hyaluronic acid preparations, and these would certainly be the recommended material for the periorbital region (which remains an “off label” use of the injections). Adverse reactions associated with dermal fillers include allergic reaction, hypersensitivity, bruising, swelling, vision loss, skin necrosis, granuloma formation, migration of the filler, chronic inflammation, lymphedema, or tissue stiffness [3]. There have been case reports documenting foreign body granulomas developing several years after autologous fat and filler injections.

2. Case report

A 48-year-old Brazilian man presented with gradual swelling and heaviness of his upper and lower eyelids for over two years. He denied any history of seasonal allergies, eyelid or ocular surgery. He also denied dry eyes or vision changes. He reported filler injections performed about three years prior of an unknown substance, however, he believed it was hyaluronic acid. He adamantly denied silicone injections. The patient had two previous injections of hyaluronidase to reduce the periorbital swelling which he believed did minimally improve his appearance, but were inadequate. Given this persistent periorbital swelling the patient was referred to a rheumatologist to evaluate for an autoimmune etiology. His rheumatologic work up was unremarkable so surgical excision to reduce the periorbital swelling was entertained. His clinical examination was notable for upper and lower eye lid excess skin and diffuses soft tissue edema and fullness, Figs. 1 and 2. He had an excellent snap test of the lower eyelid. The patient underwent a blepharoplasty. During the procedure the surgeon encountered substantial fibrous swelling involving the subcutaneous tissues and orbicularis oculi muscles (both upper and lower). Postoperatively, he returned and noted significant improvement in the upper and lower eyelid edema with good eye closure. Histology was consistent with reaction to microdroplet silicone injections. He has been satisfied with his results. Figs. 3 and 4 show the patient at his six-month postoperative visit.

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Fig. 1. Demonstrates upper and lower eyelid fullness in frontal view.

Fig. 2. Demonstrates upper and lower eyelid fullness in lateral view.

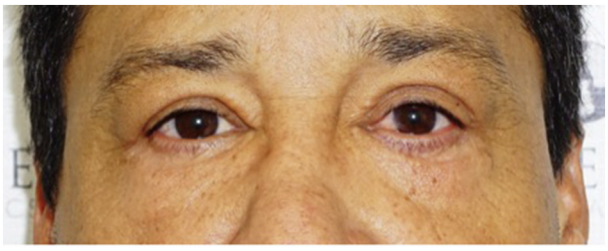

Fig. 3. Six-month postoperative frontal view.

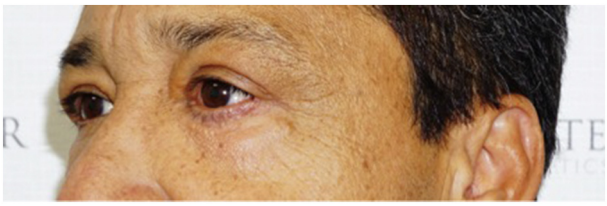

Fig. 4. Six-month postoperative lateral view: Patient consent was obtained for use and publication of images.

Histologically it was noted that the eyelid dermis was infiltrated by fatty like deposits and clear spaces focally surrounded by chronic inflammation consistent with granulomatous inflammation to "silicone oil leakage" (Fig. 5). A PAS stain was used in specimen interpretation. Based on the histological findings he was diagnosed with silicone granuloma.

3. Discussion

Fillers can enhance facial features by adding volume and correcting soft tissue defects. There are various adverse reactions associated with soft tissue filler usage such as granuloma formation and or migration. Migration can occur secondary to poor technique, gravity, and or movement of surrounding muscle leading to granuloma formation at distant sites. Pao et al. reported migration of autologous fat injection from the forehead causing the development of upper eyelid granuloma [6].

Silicone injection has fallen out of a favor as a filler due to prolonged complications that can occur even after significant time. Nonetheless, it continues to be used, particularly by unlicensed or unqualified practitioners. In this case, the injected soft tissue filler was presumed to be HA; however, there was minimal response to

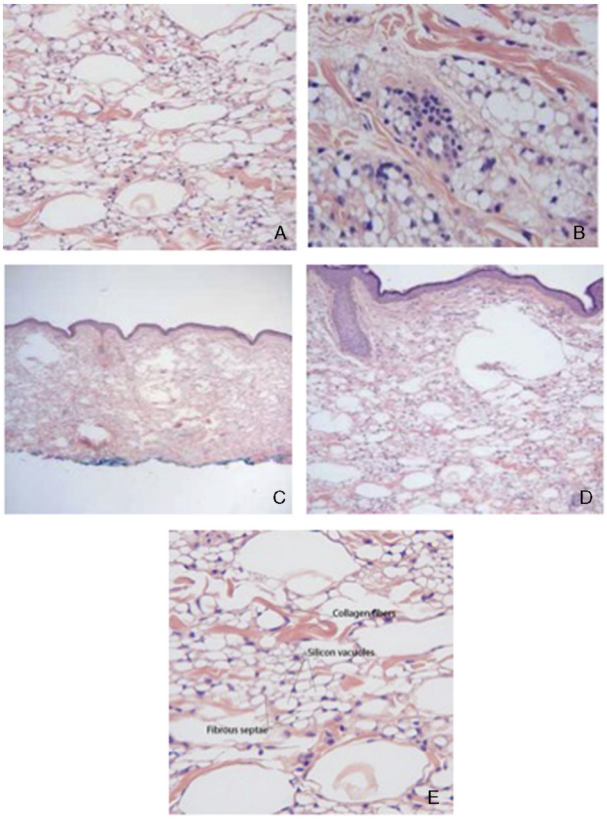

Fig. 5. Histology.
Sections showing eyelid skin with unremarkable epidermis. In the dermis, there is multiple round to oval cystic spaces and vacuoles surrounded by thin layer of fibrous tissue laying between dermal collagen fibers. Focal chronic inflammation is seen. The features are consistent with granulomatous reaction to silicon oil leakage.

hyaluronidase after a couple of injections. HA is an absorbable gel filler that is biodegradable. The duration of HA varies depending on its composition but can range from six to twelve months; however, it is possible for persistent filling to remain present secondary to breakdown components or contaminants, which can also lead to inflammation and foreign body response [1].

Polydimethylsiloxane is the liquid version of silicone that is injected for soft tissue enhancement although its use is somewhat controversial [6]. Although silicone is considered to be inert, studies demonstrate a granulomatous inflammatory response [7]. In fact, injected liquid silicone commonly forms silicone granulomas that can develop 15 years or more after injection [5].

Granuloma formation is secondary to chronic inflammation and consists of immune cells, typically macrophages or multinucleated giant cells [5]. The granulomas that form as foreign body reactions related to fillers are non-allergic responses that usually begin 6–24 months after injection [5]. Histologically, there are different characteristics associated with specific fillers and the foreign body granuloma that may develop. Silicone fluid, paraffin, and polyacrylamide gel are associated with lipogranulomas or a Swiss cheese pattern histologic profile; while collagen and hyaluronic acid is associated with a cystic granuloma pattern on histology [5].

Definitive treatment of silicone granuloma involves complete surgical removal. Commonly, however, surgical excision is deemed too invasive or not feasible for the patient and alternative options for management include intralesional and systemic steroids, oral tetracycline, imiquimod cream, laser removal, or use of a radiofrequency device [4]. These other treatments do not directly remove the silicone but attempt to reduce the inflammatory reaction to the material. As

silicone is commonly injected diffusely, resection can be very deforming and complete removal is rarely possible.

4. Conclusion

Over the years there has been an increase in the number of people obtaining FDA approved cosmetic dermal fillers. These may be used in an off label fashion. Nonetheless there are also people who have received non-approved substances by both qualified and non-qualified providers. It is important to remain aware of potential complications associated with any fillers such as migration and granuloma formation. Silicone should always remain in the differential as patients may not know what they received or deny receiving silicone and these complications can occur several years after the initial procedure [1]. Patients may be embarrassed about having a non-approved substance injected and deliberately omit this information. Surgical excision is often necessary for diagnosis and should be performed by an experienced physician.

Financial disclosure

None.

Declaration of Competing Interest

None.

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