Orbit mass secondary to migration of dermal hyaluronic acid filler

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INTRODUCTION

The popularity of dermal hyaluronic acid (HA) fillers has grown rapidly in the recent decade as they offer rejuvenation and nonsurgical cosmetic treatments for the correction of contour deformities and facial rhytids. Filler injections are performed with rapid recovery and little discomfort. Although various filler agents are available, the ideal filler has not yet been discovered, as all fillers are may cause complications.[1,2]

Fillers can be classified in various ways. One classification is by the duration of its effect: temporary or permanent.[1] This classification depends on bioavailability, chemical composition, and degradation. Quickly biodegradable agents, such as HA, may induce complications that generally disappear spontaneously within few months.[2] Other types of permanent fillers such as silicone may induce complications that occur years after the procedure.[2] These complications may include lumps, allergic skin reactions, edema, migration, scarring, skin necrosis, retinal artery occlusion, paralysis in the face, skin discoloration, and xanthelasma-like reaction.[2,3] These reactions can be associated with significant cosmetic morbidity and may result in the treating physician ordering unnecessary radiologic examinations and performing surgery in attempt to identify the etiology. Consequently, the surgeon should obtain a detailed history of possible soft tissue filler injections in the past, as nonbiodegradable material may persist for years. The patient often does not provide this information and may not recall which product was injected.[2,4,5]

We describe a patient who presented with an orbital mass secondary to filler injection and underwent orbitotomy. This case report adheres to the principles of the Declaration of Helsinki.

Abbreviation used:
HA: hyaluronic acid

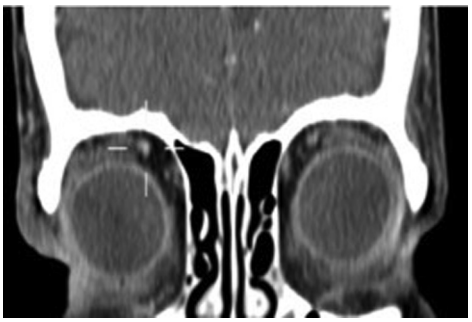

Fig 1. Coronal computed tomography found superolateral diffuse infiltration.

CASE REPORT

A healthy 63-year-old woman had 2 slowly progressing, palpable masses in her right anterior superior orbit over the month before presentation to our clinic. Her visual acuity was 6/6 for the right eye. Examination found 2 palpable painless masses inferior to the lateral superior orbital rim and upper lid mild ptosis. Extraocular movements, optic nerve function, and Hertel exophthalmometry were unremarkable.

Upon further questioning, the patient reported that 1 year previously, she had been injected with a

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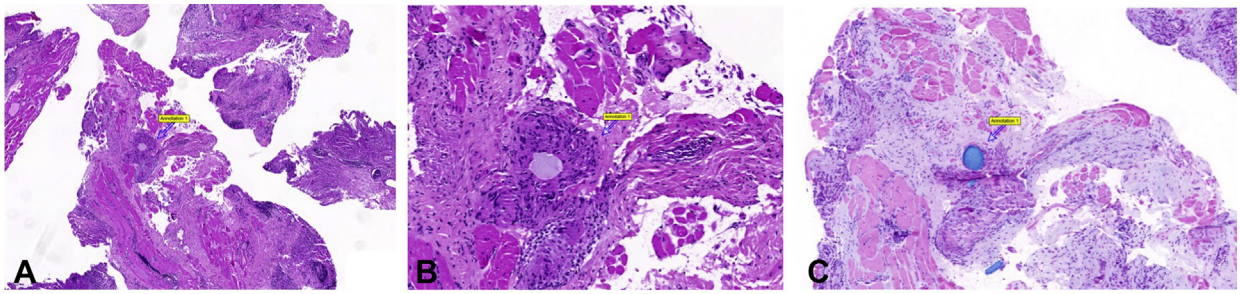

Fig 2. A, Fragments of skeletal muscle with nodular inflammatory infiltrate. **B**, Higher magnification: blueish acellular material surrounded by chronic inflammatory infiltrate. **C**, Alcian blue stain confirmed that the acellular material is HA. (Original magnifications: **A**, ×5; **B**, ×16.)

dermal filler in her forehead and lateral superior orbital rim at a private clinic. She denied any filler injection in the eyelid and could not recall which filler material was injected.

High-frequency ultrasound scanning found a hypoechogenic mass in the subcutaneous tissue of the right eyebrow and upper lid without muscle involvement or Doppler flow (indicating fibrotic tissue). Computed tomography scan of the orbit found a flat radiopaque orbital mass in the anterior-superior orbit and in the subcutaneous tissue of the upper lid (Fig 1).

The patient underwent right anterior orbitotomy via lid crease incision for excisional biopsy of the 2 masses. Histopathologic examination found a diffuse chronic inflammatory infiltrate predominantly composed of lymphocytes, histiocytes, and foreign body–type giant cells with formation of noncaseating granulomas around acellular blueish granular material. This material stained positively with Alcian blue, confirming that it was composed of glycosaminoglycans. In addition, adjacent to the glycosaminoglycan deposits, there were also few particles showing positive birefringence under polarized light (Fig 2).

Based on these findings, the mass was diagnosed as secondary to injected HA filler with an associated foreign body reaction. No further treatment was required and she remained stable at 12-month follow-up.

DISCUSSION

One complication of dermal filler injection is foreign body reaction, which is the last step of inflammation and wound healing process.[6] The reaction demonstrates various clinical and histologic features. The incidence of foreign body reaction to HA, which is used most frequently, varies from 0.02% to 2.8%, and it usually develops 6 to 24 months after the injection.[5]

Hyaluronic acid is one of the components of the normal skin, forming part of the extracellular matrix of the dermis, providing tissue support.[2] It is a nonpermanent biodegradable compound composed of polysaccharides and has same structure in all species; therefore, the rate of an immune response is low. Injected HA is cross-linked and has the potential ability to cause immediate and delayed adverse foreign body reaction, as was seen in our case.[2,7]

High-frequency ultrasound and computed tomography scanning provide noninvasive, convenient and rapid techniques for the assessment of filler-induced masses,[8,9] but histopathologic study remains the gold standard technique for confirmation. Histopathology shows a dense lymphohistiocytic infiltration with eosinophils and granulomatous infiltrates with foreign body giant cells.[5] This information can be helpful mainly for patients that were not informed or do not recall the type of filler that has been injected, as in our case.

Filler migration refers to the presence of filler at a location distant from the injection site.[4] This is a significant complication that makes the events more difficult for the patients to connect.[5] Jordan and Stoica[4] reported on the pathogenesis of filler migration and proposed several mechanisms: injection technique–related filler migration (poor technique, high-volume injection, injection under pressure), massage, muscle activity, gravity or pressure-induced displacement, lymphatic spread, and intravascular injection. Migrated granulomas should be included in the differential diagnosis for newly growing facial lumps in filler patients, even in locations other than the planned injected sites.[4] In our case, the filler migrated into the orbit after the patient underwent forehead and lateral eyebrow injections. Potential mechanisms in our case include migration of the HA through the galea aponeurosis and orbital septum by gravity facial muscle movement. Postinjection massage is less likely given the timeframe until the onset of symptoms.

Patients should be informed of the type of filler that has been injected, as adverse events from fillers may persist years after the procedure. However, in case they do not remember, histologic examinations can help to demonstrate the nature of the filler. Although many presumed filler lumps can be dissolved with the enzyme hyaluronidase, this case was unique in that it was inside the orbit; therefore, presumably a tissue diagnosis was needed. Physicians should be aware of the potential of dermal filler migration, as our case shows that migrated filler can even penetrate to the orbital space. With the increasing numbers of patients undergoing filler treatments, patients who present with new orbital masses, a history of injections should be considered in the differential diagnosis.

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